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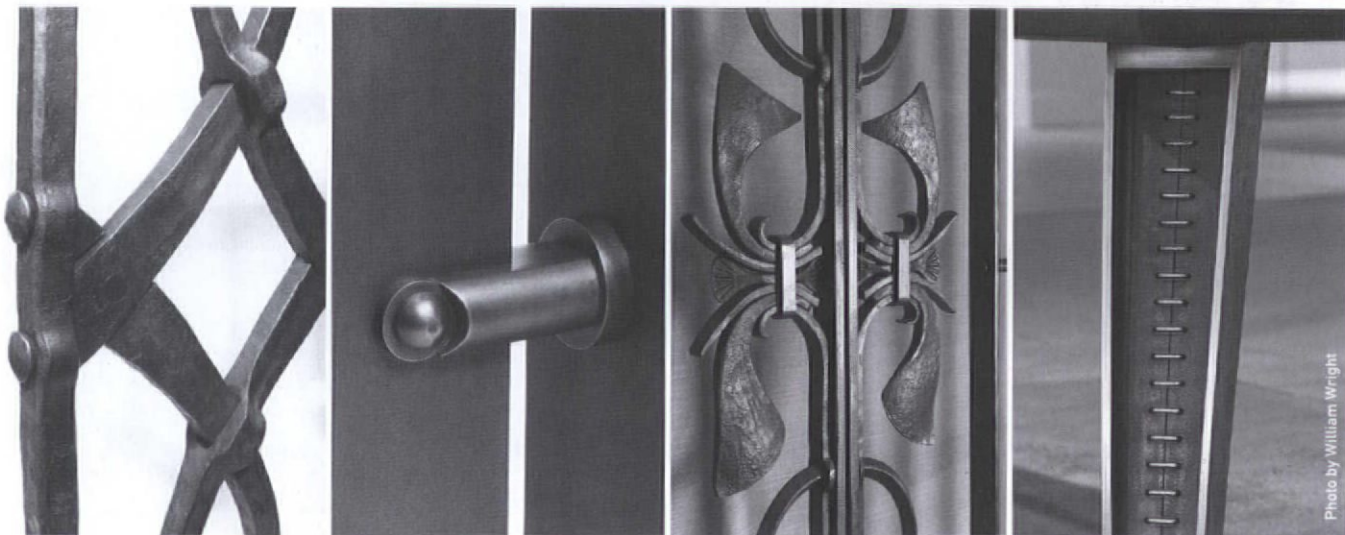


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Right: The roof of the Great Court at the British Museum, designed by Foster and Partners.

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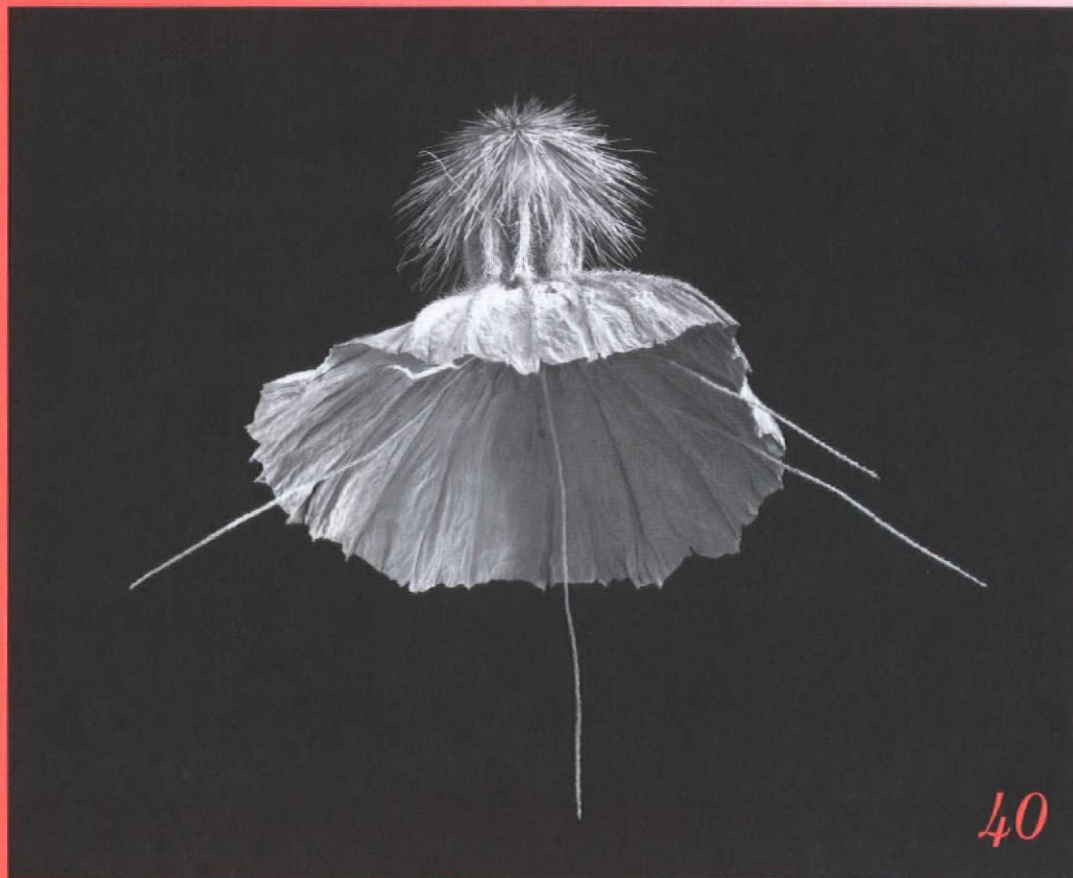


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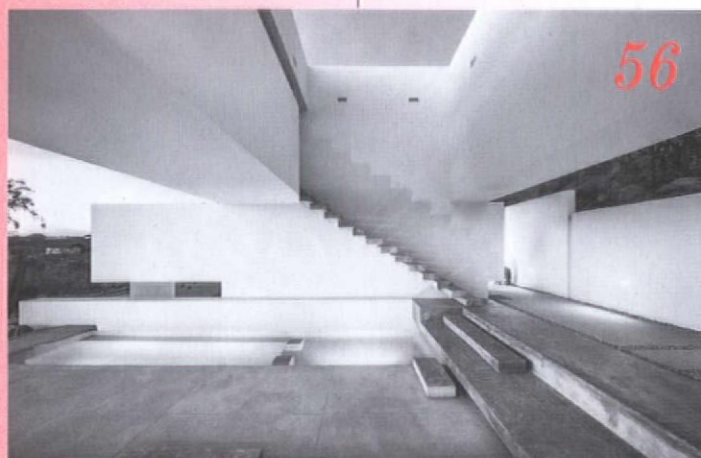


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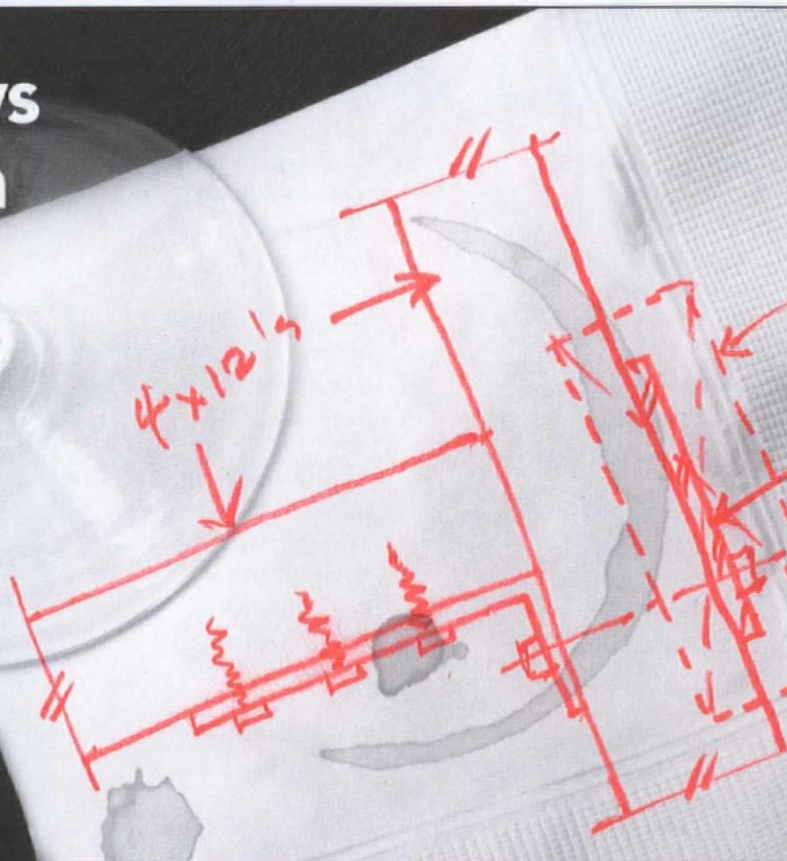
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A black and white photograph of three men in a workshop. The man on the left has long hair and a beard, wearing a hat and overalls. The man in the center is smiling, wearing a dark shirt and overalls. The man on the right has a mustache and is wearing a cap and a button-down shirt. They are sitting on a workbench in a cluttered workshop filled with tools, equipment, and materials. The word "EXPERIENCED" is overlaid in large white letters across the middle of the image.

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Rain Oculus, Marina Bay Sands, Singapore, 2011. A large whirlpool forms inside a 70-foot diameter acrylic bowl and falls two stories to a pool below. The artwork, a collaboration

ART MATTERS

**The Turbulent
Studio****Ned Kahn's
Unpredictable
Public Art****Erin Langner**

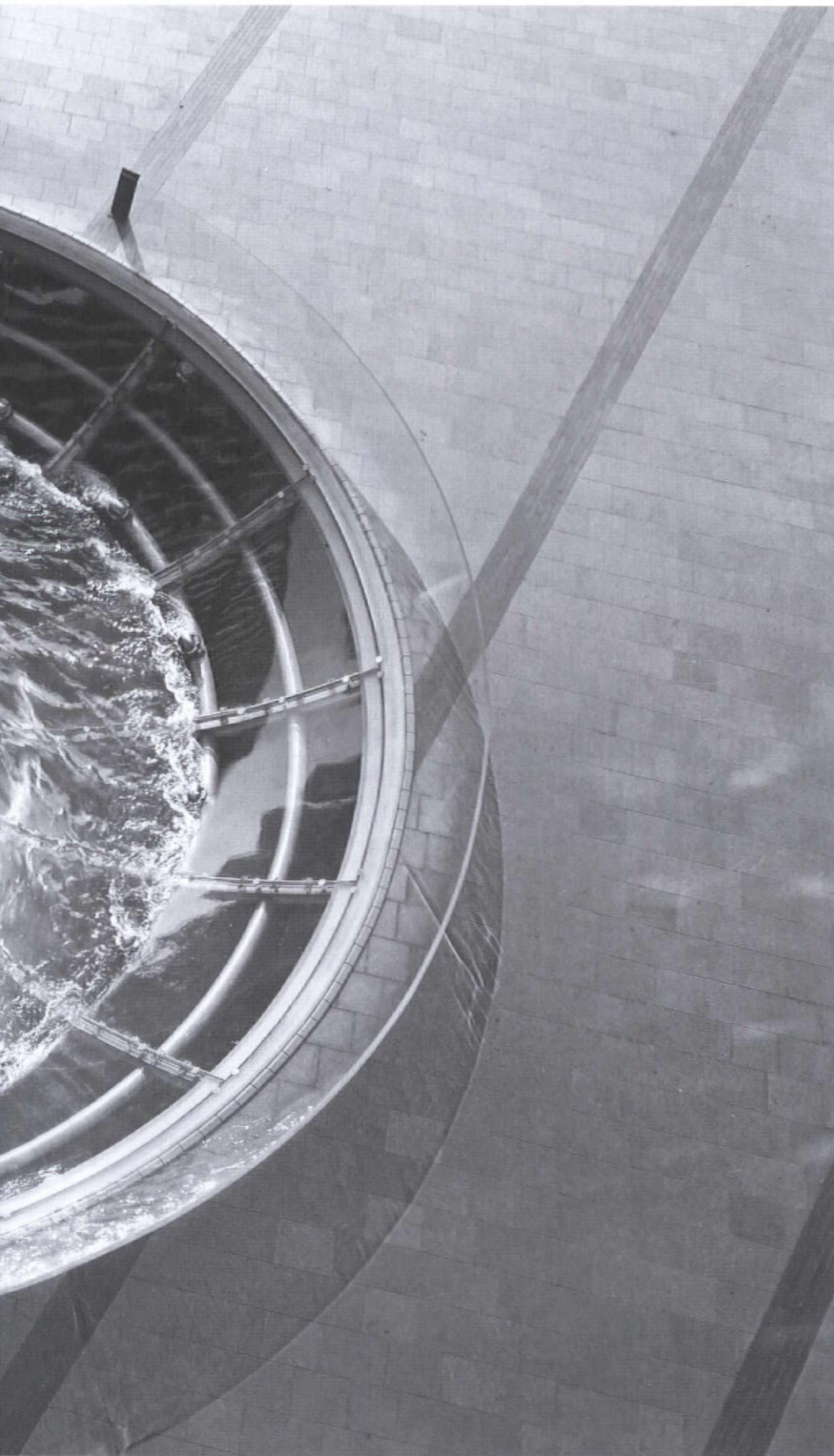
Photography: Ned Kahn

A simple set of steel, interlocking bars that rotate wildly with the turn of a knob may be artist and MacArthur Genius Ned Kahn's best-known work of art. His iconic exhibit titled *Chaotic Pendulum* at San Francisco's Exploratorium has inspired countless people to stand mesmerized by the unpredictability of this modest sculpture that evokes the wonder underlying works of both science and art.

Although Americans may be most familiar with Kahn's human-scaled works at the Exploratorium and other museums, over the course of his career the artist has expanded his visualizations of natural processes to an international set of building facades, immersive vortexes, massive fountains and other public works that continue to pursue the boundaries of perception. Along with Seattle artists and designers Lead Pencil Studio, Kahn was selected to create a new work that integrates the forthcoming electrical power substation at the intersection of Denny Way and Stewart Street with the surrounding Cascade neighborhood in Downtown, Seattle.

I recently caught up with Ned to consider his past works in the region and find out more about the new project.

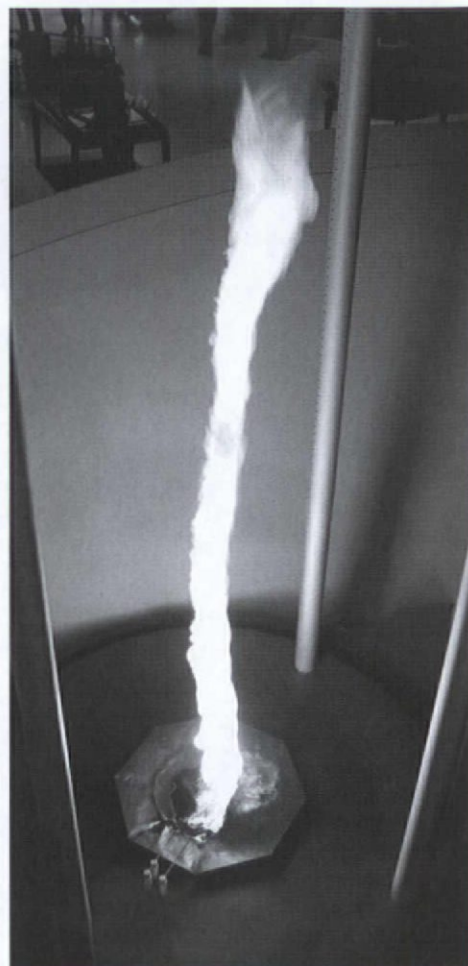
Erin Langner: I found it interesting that Lead Pencil Studio and you both have a history of being artists-in-residence at the Exploratorium—LPS in 2007 and you from 1982–95. Especially given the length of your stay and your apprenticeship with founder Frank Oppenheimer, how did that experience impact your practice?



with architect Moshe Safdie, functions as a skylight and a rain collector.

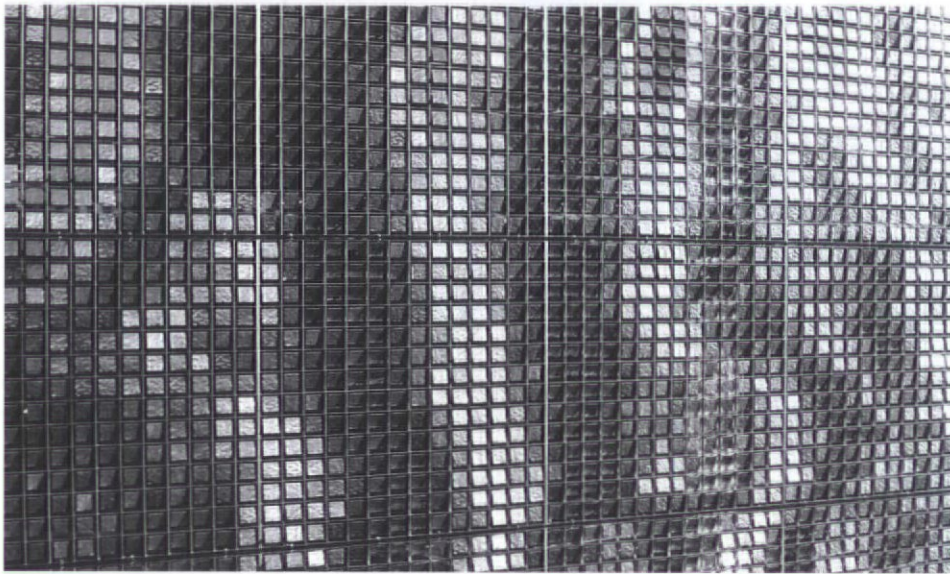


Above: Firefly, San Francisco, CA, 2012. A collaboration with KMD Architecture for the San Francisco Arts and Public Utilities commissions, *Firefly* reveals the wind moving around and through it. The hinged, polycarbonate panels swing with the patterns of the wind. By day, the work appears like rippling waves of glass. By night, the back-and-forth swinging of the panels triggers the flickering of tiny LED lights.



Top right: Fire Vortex, the Swiss Science Center, Technorama, Winterthur, Switzerland, 1997. Suspended in a dark atrium of the museum, a series of fans and blowers creates a 20-foot tall vortex of swirling fire that forms over a pool of burning kerosene. The flame spirals up through the spinning outer core of the vortex, leaving a hollow calm in the center.

Bottom right: Encircled Stream, Seattle, WA, 1995. A collaboration with Atelier Landscape Architects, this courtyard is centered around a large whirlpool that rhythmically fills and drains every few minutes, suggesting the countless cycles of floods that have sculpted the terrain of Eastern Washington.



Glacial Façade, Issaquah Highlands Park and Ride, Issaquah, WA, 2006. The Issaquah Highlands Park and Ride cuts the crest of the Sammamish Plateau like the glaciers that inspired Ned Kahn's installation on the structure's façade. Shifting with light and weather conditions from opaque to transparent, *Glacial Façade's* surface undulates in the breeze as if made of cloud or water.

Parking garages and blank façades of buildings present opportunities to bring some semblance of nature into the more lifeless pieces of urban fabric in our cities.

Ned Kahn: Frank Oppenheimer and the Exploratorium were both major influences. I became intrigued by the creation of artworks that were similar to scientific experiments. I called them "Questions of Nature." Most of my early works related to visualizing turbulence in a variety of mediums: water, fog, air, fire. While creating these works inside the museum, I frequently had the thought: What would this be like at an architectural scale?

How do you determine which natural elements will become the mediums for a site-specific piece?

I usually begin by investigating the energy moving through the site and considering how I can tap into or reveal its flow patterns. With some projects, the air currents or the passage of light resonated most; others were more suited for moving water and fog. Sometimes nothing interesting occurs within the location, and I have to create an artwork that introduces its own energy.

Is there a natural process that is particularly difficult to capture?

For years I wanted to work with fire, but nobody in the US would ever let me finish the sentence. Finally, a museum in Switzerland let me do a fire vortex, and we proved to

everyone that it could be done safely. Now, I have a number of fire pieces around the world, although still none in the US.

I also tried to create an ice vortex, but global warming seems to be working against me on this one.

Shortly after your residency at the Exploratorium ended, you created a piece titled *Encircled Stream* at the Seattle Center Founder's Court, based on Washington's geological history of flooding. Was it liberating at that point in your career to be working outside rather than inside a museum?

Pursuing the idea of working at an architectural scale led me to start applying for public art projects and ultimately collaborating with architects, landscape architects and engineers to visualize turbulence at the scale of buildings. Public art projects like the *Encircled Stream* forced me into new ground, suddenly having to deal with the realities of the design and construction of public spaces.

Your other project in this area is *Glacial Façade* in Issaquah, an installation that covers the side of a park-and-ride garage, arguably one of the less inspiring architectural features of an urban environment.

What engages you when creating something sited for a more banal, man-made structure, given your work's emphasis on natural processes and imagery?

Although the essence of my artwork is rooted in natural process and phenomena, the works themselves are often constructed out of very unnatural materials: metal, plastics, glass. Parking garages and blank façades of buildings present opportunities to bring some semblance of nature into the more lifeless pieces of urban fabric in our cities. Often in projects, by the time the architects get around to designing the parking garage, they are spent and happy to drop it in my lap.

Compared to most architectural challenges, parking structure façades are simple; they just need to breathe and visually mitigate the cars inside. These façades have the potential to open a window into nature and create a visual oasis for people to reconnect with the natural world.

You recently discussed an interest in creating more work that executes a specific function within its site. Can we expect a functional aspect as part of your project for the Denny Substation?

Much of my current work involves systems for gathering or saving energy. I recently installed a large, rain-gathering vortex and a 1,000-foot long by 200-foot tall cable net structure that functions as a sun shade for a new hotel in Singapore. In San Francisco, I also recently completed a wind-powered lighting system for a high-rise building and am currently working on a water feature that will be powered by passing buses in a new transit center.

I am intrigued with the task of creating an artwork that will somehow be useful for the Denny Substation. I have been pestering the engineers at the power company with all kinds of questions about what really goes on at the substation on a physical level. We will see what comes of it!

Ned Kahn is an environmental artist based in Sebastopol, California. His work is included in the collections of many museums, including the Exploratorium, San Francisco; the Museum of Science and Industry, Chicago; and the American Museum of Natural History, New York. He has received numerous public art commissions throughout the world and was awarded a MacArthur Genius Fellowship and a Public Art Award from Americans for the Arts.

Erin Langner is manager of adult public programs at the Seattle Art Museum. She is also an independent arts writer and contributes to the New American Paintings blog and *The Stranger*.



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TRAVELOGUE



Buddha and pillars at Mihintale.

Genius of Landscape **An Ancient Sri Lankan Experiment** **in Sustainable Design**

Sam Hammer

Photography: Sam Hammer

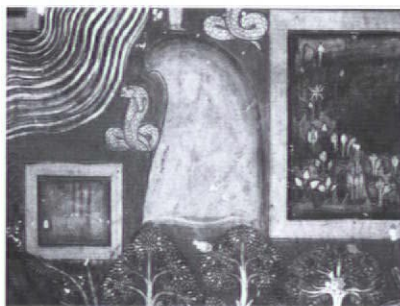
On the ground you wouldn't know it. Dusty roads, scrub forest, greasy towns, the occasional cooling expanse of rice paddies. But from the citadel rock of Mihintale, the founding place of Buddhism here and the highest point for miles around, you sense the power of this place, agriculturally, socially and politically. It is a landscape of culture and spirituality, a landscape that reflects its people and their collaboration with nature. From the vantage atop Mihintale, you stare out to the west, and in front of you lie the giant dagobas of Anuradhapura, enormous white bubbles in the hazy, smoky morning landscape. Along with Mihintale, these dagobas epitomize the cultural and political hegemony of the Sinhalese in ancient times and in the present. This was a thriving kingdom of power, a genius landscape.



The giant stupa of Mihintale.

A place of great natural beauty, ancient Sri Lanka was, and to some extent still is, a symbiosis between humans and nature. An island the size of West Virginia, Sri Lanka has two monsoon patterns. Depending on where you are on the island, this translates into extended periods of drought, conditions less than ideal for growing the country's national staple, rice. About 2,500 years ago, the ancient Sinhalese, who traded with civilizations as far away as Greece, started designing *bunds* (dams) that transformed their landscape. The development of bunds and their associated *wewas* (irrigation ponds or "tanks," the English term) enabled the ancient Sinhalese to grow enough rice to support a burgeoning, art- and architecture-rich civilization. Wherever you go now, you see ancient evidence of the three A's, Agriculture, Architecture and Art, much of it focused on the wewas.

Some examples. In the famous Golden Temple of Dambulla, a series of caves holds



Wewas depicted at Dambulla.

hundreds of Buddha statues. The cave walls and ceilings are covered with paintings. In one cave I discover something the guidebooks missed, a series of paintings that depict the natural fauna and flora of Sri Lanka arranged around a map-like image of wewas. The tanks are not like any I've seen so far. They are squares with rivers or canals running into them and lotuses growing out of them. My "wewa moment" at Dambulla is to be repeated many times as I slowly discover the nature of the thousands of wewas, enormous, incongruous sheets of water that cover much of Sri Lanka.

I am in Jaffna in the far north. Once the second city of Sri Lanka, isolated and besieged over decades of conflict, it "opened" only a few years ago. Its visual stimulation is so strong that I decide to stay some days and walk the hot streets and take pictures. Dodging buses and bicycles, I walk for miles and find tanks everywhere. Some, like the wewas depicted in Dambulla, are square. Each tank is associated with a Hindu Kovil or Buddhist center. Canals crisscross the city, empty now but once running with



Tank and kovil in Jaffna.

water along footpaths that remind me of the sunken roads of Surrey. I realize these were boundaries! The tanks and their associated religious architecture were originally the focal points of separate villages that grew together over the centuries.

Once, each village was responsible for the maintenance of its bund and wewa and fed itself on rice the wewa irrigated. Wewas started as local endeavors and later became the focus of kings. Rulers who wanted to centralize their power had to feed their people, which meant growing more rice. More rice, more irrigation, bigger wewas. I travel to an incredibly atmospheric corner of this incredibly atmospheric country, finding myself on a road atop the bund of Kala Wewa, one of the largest irrigation tanks in Sri Lanka. Out of proportion with the human landscape around it, the bund is as large as a Mississippi River levee in Louisiana. To my left is Kala Wewa,



Gigantic Buddha at Kala Wewa.

its horizon just visible in the rain, and to my right, far below the level of the water, are villages, paddies, banana groves, coconut palms and jungle. My driver stops at steps hewn into granite. I take off my flip-flops and climb the slippery steps, gingerly in the rain, and behold the massive Aukana Buddha. Aukana is an important pilgrimage site blessedly overlooked by tourists. I am dead alone in pouring rain with a giant graceful granite Buddha, serene in his rock robes, built by a great ruler to face the wewa he made for his people. The colossal Aukana Buddha and Kala Wewa bund are design masterpieces.

Back to the heights of Mihintale. Broad expanses of irrigation tanks, huge sheets of water filling the flat plain with life. In a real

way, the tanks, not the rice fields, are the source of nourishment here. The paddies lie exhausted and fallow now, but the tanks teem with plants and animals. Even from a thousand feet above you can see the lotuses and lilies, sedges, algae and abundant bird life. I assumed the tanks would be pristine expanses of water, but they are hotbeds of biodiversity. Just as the tanks continuously refill with water, the teeming organisms in them replenish the nutrients that fertilize the rice. We harvest the rice and eat it, a one-way flow. But the tanks, as reservoirs of richness, seep nitrogen, phosphorus and other nutrients into the thirsty rice fields.

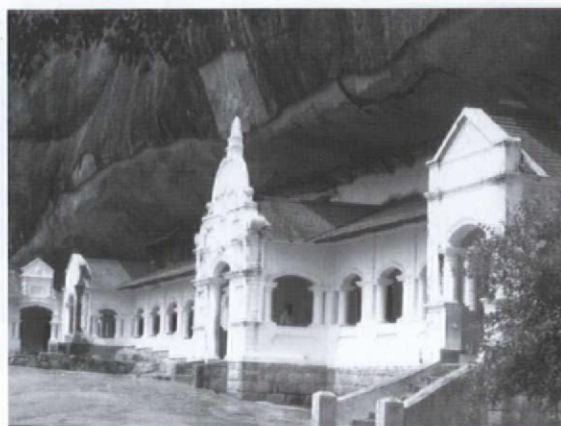


A series of irrigation ponds in the dry zone.

This millennia-old experiment in sustainable design continues in the layout of villages. Wetlands below the wewa are for rice. On higher ground, the ubiquitous banana. Above the banana gardens, coconut palms and spice trees, and on higher ground close to the houses, vegetable gardens. If you are lucky, your guesthouse serves vegetarian rice and curry. You are eating a meal that was grown within a kilometer of where you sit. If a rice paddy is near your guesthouse, like the one I stayed at in Kataragama, you will hear the thrum of insect and bird life all day and night.



Sri Lanka's future.



The Cave Temple of Dambulla.

Wherever you go now, you see ancient evidence of the three A's, Agriculture, Architecture and Art, much of it focused on the wewas.

The birds feed on the abundant fish that crowd the wewas, and the fish in turn control mosquitoes.

The colonial British subjugated the Lankans by tearing down bunds and draining the wewas. Malaria and starvation decimated the countryside and nearly ended the great experiment of the wewas. Many are



Harvesting rice by combine.

entirely in the service of its builders. The tanks and their reservoirs of nutrients, the fish inside them and the rice they nourished all went to the kings, and through them, to the faithful, who contributed their labor, building, maintaining, planting, harvesting and processing. Evidence of royal power is part of the broad landscape, with bubble stupas spreading across the horizon like clouds that touch down onto the earth, and giant Buddhas like the Aukana. But the hegemony of the Sinhalese civilization lay in irrigation and the agricultural works they mastered. A landscape of richness, sustained over thousands of years.

Sam Hammer is a professor at Boston University. He teaches there and at the Boston Architectural College. He earned his doctoral degree in evolutionary biology from Harvard University and specializes in communicating science to non-scientists. With a background in cultural anthropology and a love of design and fine arts, Sam is also a fellow of the National Endowment for the Humanities.

restored now, and Sri Lanka is malaria-free. But new technologies intrude on the ancient landscape. Large rice paddies are harvested by combine now, not a good thing for the soil, and fertilizers and pesticides are making their appearance. Fewer people work directly in agriculture, another by-product of development.

Along with Buddhist religious heads, the Sinhalese kings who once controlled the wewas built a landscape at once natural and



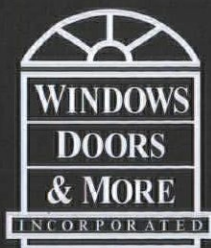
Rural Sri Lanka.



Top: Ancient monastery tank. Bottom: Roadside rice sale, southeastern Sri Lanka.



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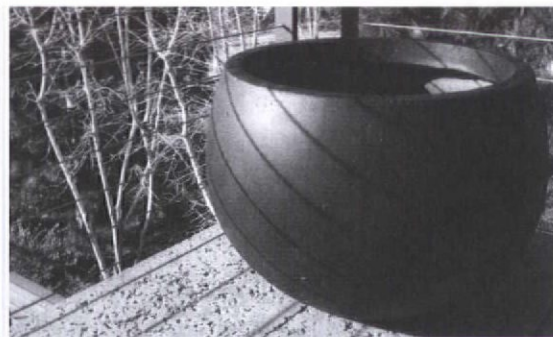


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Art is Science is Art

Elucidating Science Through Visual Language

David Ehlert

Illustrations: David Ehlert



Illustration of a nurse-like cell that promotes B-cell Chronic Lymphocytic Leukemia (B-CLL) survival.

Within the three-pound universe we call the brain, an active neural landscape lights up when an idea bursts into existence: a personal Big Bang!

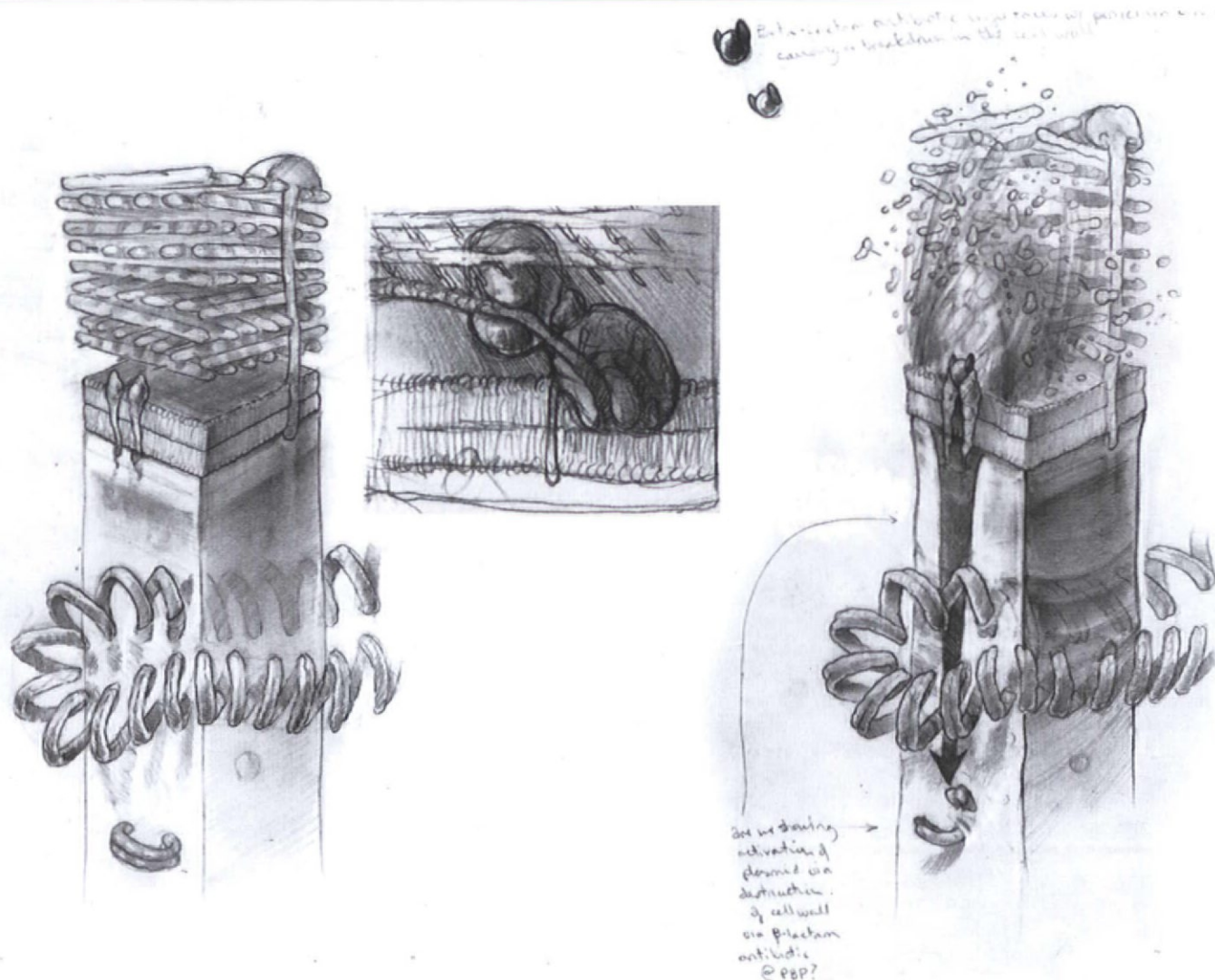
These sparks are the catalysts of creativity; in their wake come wild theories, hypotheses and experiments, both scientific and artistic. It's where earth's roundness is proven, AIDS can be cured and Alzheimer's becomes a disease of the past. It's also where the idea-translation process comes into focus.

A scientist's discovery – beautifully profound, complex, hopeful – resides at the mysterious intersection of art and science. A medical illustrator's work – elegant, focused,

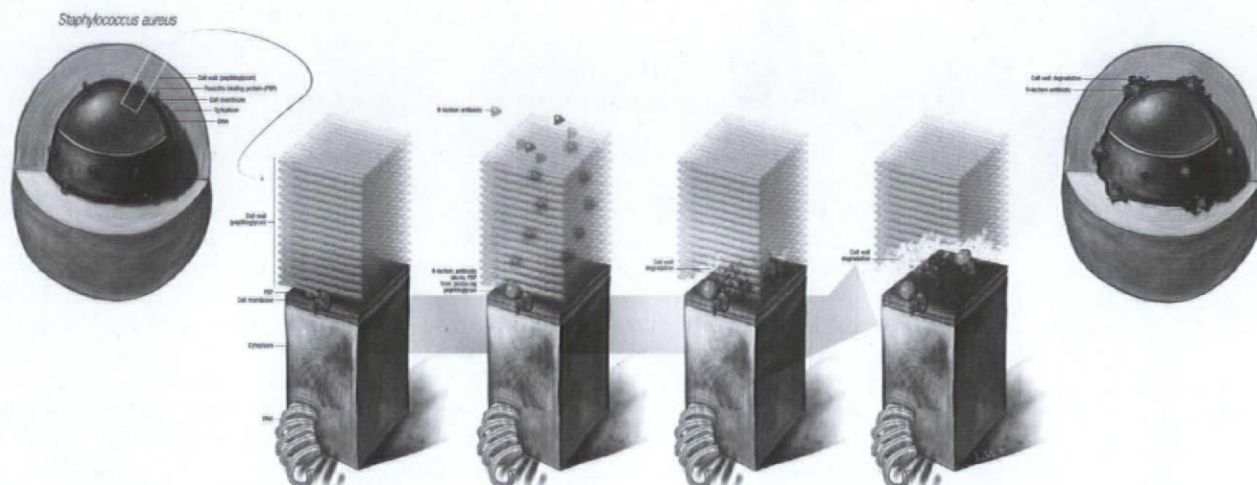
didactic – also resides at this intersection. Through an active partnership between scientist and artist, a symbiosis results which has the potential of impacting life as we know it.

As a strategic communicator for life sciences, researchers entrust me with the critical mission of translating their sparks of genius into immersive images, storybook style sequences and crafted data visualizations. The art and act of translating their science is as full of experimentation (i.e., research, ideation, interpretation, composition, color, technique) and eureka's as science itself.

At the intersection of art and science is an opportunity to create a visual language that can have an immediate and/or lasting impact



Early research and development for illustrations focused on the extracellular protective barrier of methicillin-resistant *Staphylococcus aureus* (MRSA).



Final series of *S. aureus* illustrations visualizing cell wall degradation via the beta-lactam antibiotic.

As a strategic communicator for life sciences, researchers entrust me with the critical mission of translating their sparks of genius into immersive images, storybook style sequences and crafted data visualizations.

that fuels humanity's innate desire to look at more, create, share, learn and – last but not least – be entertained throughout the experience.

The use of technology to deliver unexpected (surprising and delightful) experiences with data is integral to how we translate innovation into visualizations and then into understanding. Here are a few observations:

CMS-driven tablets are providing leadership teams with platforms to become more conversant in the science driving their biotech, expediting the delivery of pivotal, one-on-one dialogues with investors.

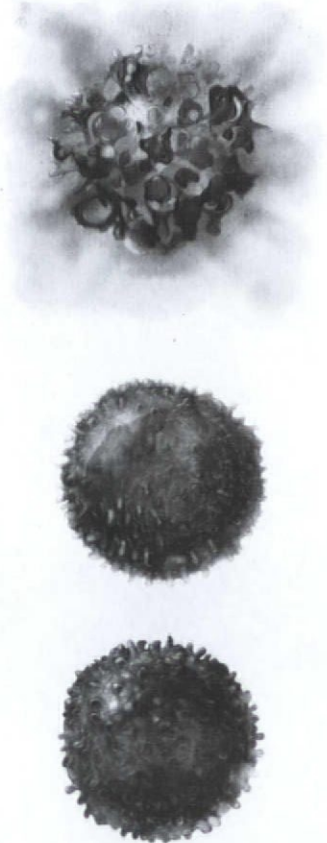
Media-rich web pages are bringing the art of storytelling to biosciences, delivering beautiful data visualizations and enabling users to discover information through intentional narrative flow.

3D printing, no longer a novelty, is making patient data tangible. Medical models, surgical guides, hearing aids, dental applications and implantable devices have all benefited from additive manufacturing. But on the

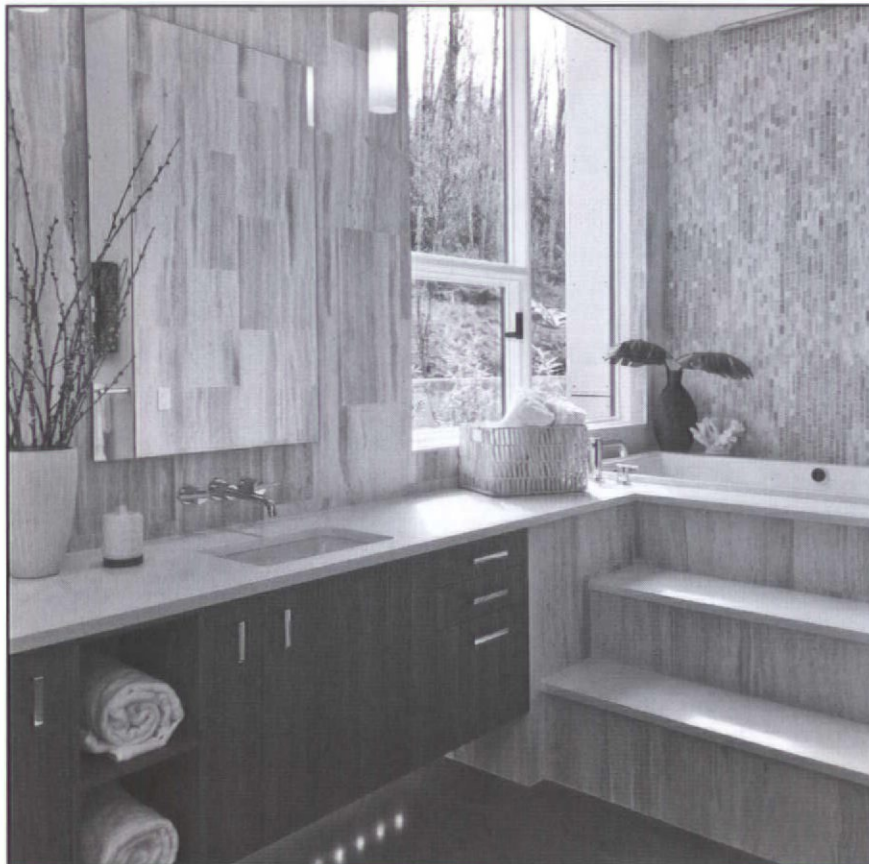
forefront are bioprinters that use a “bio-ink” made of living cell mixtures to print/build a 3D structure of cells, layer by layer, to form human-compatible tissue.

The scientist-artist partnership provides a greater chance for clear communication and idea development, garnering increased exposure and financial support. Done well, the visual narrative created communicates the intended message and serves as a catalyst for change that continues the advancement of life sciences.

David Ehlert is the co-founder and certified medical illustrator at Cognition, a strategic communication firm for life sciences. A sleuth-turned-storyteller and passionate illustrator, he works with the region's brightest researchers, helping them tell their unique science stories and creating brand-driven visualizations. David is also a regular guest lecturer at the University of Washington.



Top: Conceptual visualization of a B-cell undergoing apoptosis (cell death). Center: B-cell illustration used in B-CLL visualizations. Bottom: T-cell illustration (similar appearance to a B-cell) also used in B-CLL visualizations.

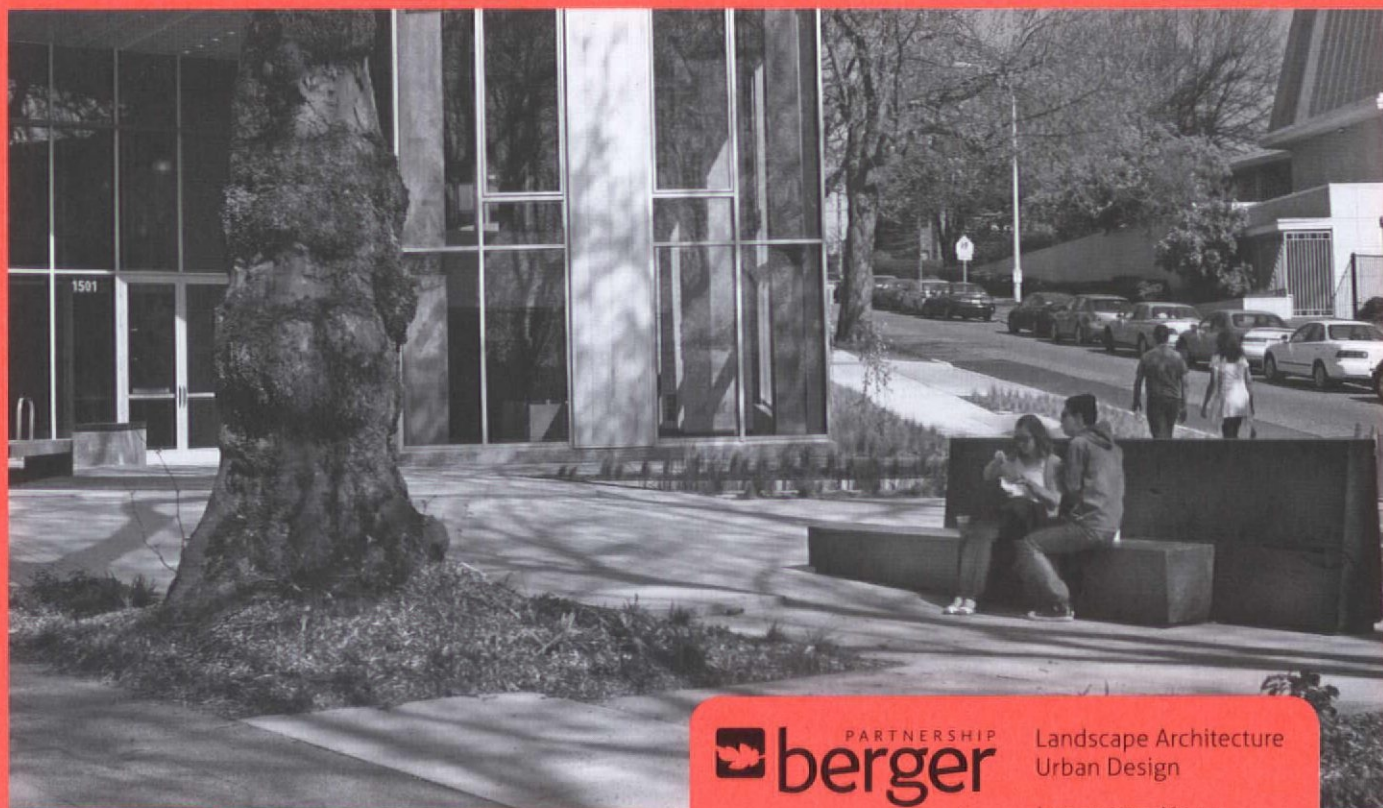


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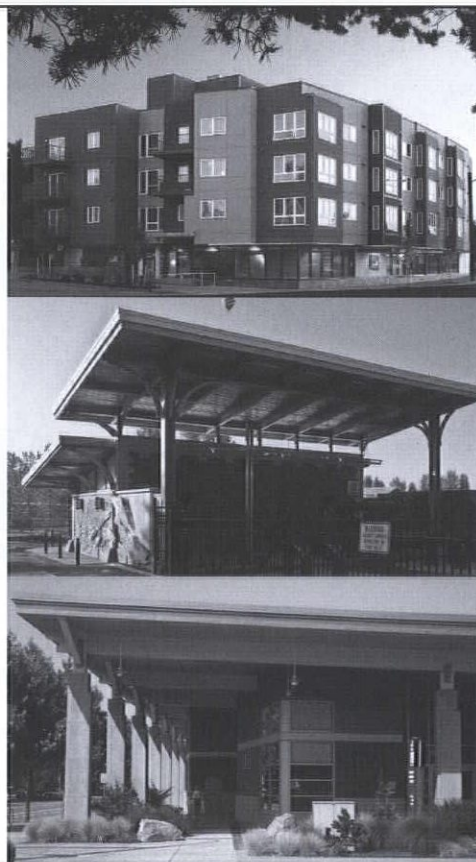
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Buster Simpson, *Untitled (Woodman in dumpster with hole marking)*, 1974. Black and white photograph. Courtesy of the artist.

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Laura Kina Gosei, 2012. Oil on canvas, 30" x 45"

Science, Art

The most beautiful experience we can have is the mysterious — the fundamental emotion which stands at the cradle of true art and true science.

— Albert Einstein

Art and science are forms of inquiry. Artists and scientists ask questions. Both engage research, and most often those who practice want to share the knowledge generated. However, this does not translate to art as being the same as science—they are distinct. And they are each equally important to our collective future. Societies that nourish diverse forms of inquiry generate new knowledge and shape how we act in the world.

Science and art have complex social histories. As noted in the *Oxford English Dictionary*, prior to the eighteenth century, science was often used interchangeably with art to “describe a particular body of knowledge or skill: ‘his science of meter, of rime and of cadence.’” It was in the eighteenth century that science came to define skill requiring theoretical knowledge, while art represented skill requiring practice. Today, we believe both take theoretical

and Inquiry

knowledge and require practice. We argue about whether one focuses on the unique and subjective (art) and the other on universalities (science). Carl Sagan once wrote: "Science is a way of thinking much more than it is a body of knowledge." The same can be said of art. In the last issue of ARCADE, devoted to STEAM (STEM + Art and Design thinking), John Maeda wrote of Leonardo da Vinci's observations that art is the queen of science. We might look to Shakespeare's use of astronomy, an emerging science in his day, or the making of a Stradivarius violin to find art and science as dual frames for how we explore and craft our world. Throughout history, science and art have engaged in a dynamic dialogue with one another, crossing boundaries of experimentation and knowledge.

Where the connections between science and art are strongest is in a long-held belief that beauty and truth are inextricably linked. E. O. Wilson once wrote that "the elegance, we can fairly say the beauty, of any particular scientific generalization is measured by its simplicity relative to the number of phenomena it can explain." Newton's law of gravity is clear, symmetrical and harmonic. Darwin's theory of evolution is so pleasing in its simplicity – evolution, on one level, is an uncomplicated explanation of change over time – and relevant to all life forms.

And yet, what is right in art and science has changed. Artists have altered what we experience as beautiful while shifting our modes of investigating the world around us. Science, too, has changed our views, our understanding of challenges as small as the role of bacteria in human health and as large as global climate change.

This brings us to the idea of messy ecosystems, complex human behaviors and the elegance of asymmetry. Scientists observing the phenomena of DNA, of gorilla behavior, of ant-to-ant communication and of the Big Bang are engaged in describing a far more complicated reality than we once thought true or even possible. Contemporary artists are investigating the intricacies of chaos and the complexities of the world as we know it. They are offering alternative vocabularies and frameworks for inquiry. Art is not science, nor is science art, but the conversations between the two might be one of the most important contributors to our collective future.

Without the arts, science is hobbled. Without science, art is static. Only when we begin to appreciate

the profound impact of both the arts and the sciences on everything will we value their significance. The ensuing confluence of intelligence will lead to the creative experiments and insights that will fuel our responses to the challenges ahead—climate change, population growth and urbanization.

While in the pages of ARCADE many artists have written about how they employ science, this feature section explores connections between art and science from the perspectives of scientists. The issue builds on the STEAM theme to consider how scientists describe art as it informs their investigative process. There is no ultimate truth to be identified but a range of thoughts. One writer practices (a lot) his science and his art, musing on the relationships and distinctions. Others describe their creative investigations of scientific questions as a way of thinking like an artist rather than necessarily producing a work of art. Their work raises the question of when representations are artistic endeavors and when they initiate creative explorations; the work of the San Francisco Exploratorium offers one answer, while others are described in the art of ant watching and by means of the imagination required to propose glue-on shoes for a rhino. Yet another response is suggested by means of a photographic essay of plants as a creative product of a systematic process of investigation. Moving further toward intersections of art and science is an essay on ecology and landscape design and another on architecture and public health. These writers argue for a deeper integration of art and science in the design fields in order to shape more responsive and resilient built environments. This feature section is an exploratory narrative that moves from the distinct arenas of arts as pursued by one person to the role of interdisciplinary practices that engage the sciences and the arts. In all of these essays, inquiry replaces directive—for that is the foundation upon which both the arts and the sciences build. ▲

Thaisa Way is a landscape architect, an architectural historian and an associate professor of landscape architecture at the University of Washington.

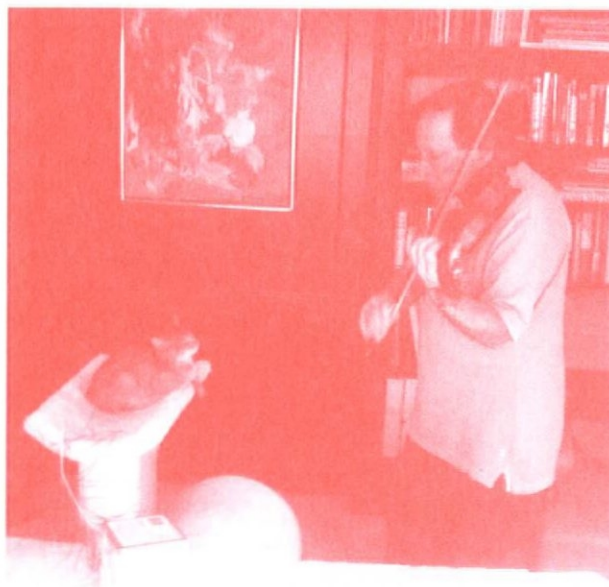
MARK PTASHNE

Doesn't this describe the goal of every serious artist and scientist: to discover principles that work – subject to experimentation – and open new worlds?

Musings on Music and Science

DISCOVERY AND EXPERIMENTATION

I thought it odd that in their times, both Beethoven and Bach referred to their recent accomplishments in the “science of music.” As Christoph Wolff explains in *J.S. Bach: The Learned Musician*, “Bach was surely influenced by the climate of inquiry and search for truth that defined philosophy as ‘the science of all things that teaches us how and why they are or can be.’” The “why” and “can be” strike me as highly suggestive. Doesn't this describe the goal of every serious artist and scientist: to discover principles that work – subject to experimentation – and open new worlds? The player first encountering the inner parts of a late Beethoven quartet is amazed that such wild lines and harmonies not only work—they are beautiful. Imagine how Beethoven felt when he “discovered” them, and realized how music, even then, “can be.” The full implications are usually not immediately apparent. When asked his opinion on a new work of music, Stravinsky said, “It is too early to tell”; and in regard to the scientific analysis of simple cases, Karl Popper said, “Basic models tell us more than we can at first know.”



THE “PAST”

Composers and scientists are burdened differently by the past. Schumann spent hours analyzing Schubert, especially the *E-Flat Piano Trio*. Wagner wrote on how to conduct Beethoven's *Ninth*. Schumann advised aspiring composers to let Bach's *Well-Tempered Clavier* “be your daily bread—there is no end of learning.” Scientists, in contrast, tend to regard anything done more than three weeks ago as “ancient history.” We rise each morning to refashion the world. Might artists show scientists how



the past can be an inspiration; do we ignore that at our peril?

OBSESSION

I am skeptical that some "ability" in one of these areas (e.g. playing the violin) correlates with an "ability" in another (e.g. being a scientist). What is required is *obsession*.

And who has time for three or even two obsessions? Yes, scientists burn the midnight oil, but so do musicians. Coltrane practiced all day, every day; even between sets he practiced. Birgit Nilsson stuck her head out of the porthole on her way from London to New York to practice unheard. And Heifetz was overheard practicing a single shift for an hour before a concert. For most of us, obsession is a matter of desire and the ability to arrange our lives to give in to it.

PROFICIENCY

Standards of proficiency for players have risen dramatically in recent years, probably much more so than for scientists. Making a living is easier for a scientist than for a musician today. The typical non-musician does not appreciate how highly accomplished is the average member of a major symphony orchestra. I love a remark attributed to the painter Matisse: "I practiced the violin until I had become technically acceptable, by which point I had lost all ability to be expressive." Today, it is unlikely that he would be considered "technically acceptable."

PRACTICE

I would have a hard time explaining why I practice the violin for hours a day. So did the painter Jean-Louis David, by the way, and the comedian Jack Benny (as did the monster Heydrich). I am now used to ordinary scientific struggles, long periods when nothing seems to happen punctuated intermittently by the relief of coherent answers. But I never fail to be amazed at the more frequent epiphanies that come from serious violin practice. I do exercises and suddenly, mysteriously, I can do something I couldn't do three weeks ago. For me, each time, it is like a religious experience, a gift.

Today I was practicing, deeply "concentrating," when suddenly I had a scientific idea. I put down my violin and emailed my lab. Never mind if the idea was any good. Linus Pauling was asked how he managed to have so many good ideas, and he replied that it was easy—he had many ideas, and maybe one in a hundred was worth something. So it's important to have two goals: Put yourself in a state conducive to having ideas and then try to figure out if any of them are any good.

CRICKET

I once asked a professional violinist/musician (who I much admire) whether he watched television as he practiced, and he quickly said, "Never!" His wife, who was also at the table, said, "Always!" Brain people claim that even though you might think you are paying attention to two things at once, you are actually switching your attention, rapidly, from one to the other. So maybe you only concentrate on the music half the time—big deal. But perhaps the best way to nurture your obsession with the violin is to move to England or Pakistan and practice while watching a cricket match. Significant events will occur only rarely; you won't understand them even if you notice; and it will go on all day. ▲

Mark Ptashne holds the Ludwig Chair of Molecular Biology at Memorial Sloan-Kettering Cancer Center in New York. A member of the National Academy of Sciences, his work on gene regulation has garnered numerous national and international awards including the Lasker Prize for Basic Research. In addition to his many research papers, he has written two books: A Genetic Switch (now in its third edition) and Genes and Signals (co-authored with Alex Gann). He studied science (not music, alas) at Reed College and then Harvard University. He has studied the violin privately with Roman Totenberg, Eric Rosenblith and Patty Kopec and now studies with Mela Tenenbaum in Brooklyn.

FABIO GOVERNATO

Is there a difference between art and science? With designing a new typeface or understanding how galaxies form?

The Astrophysicist and the Photographer

What is the difference between art and science?

Let's start from the beginning: All your fonts look the same to me. I also find math difficult, running hard. Photography? A struggle. All of the above? Often a bit tedious, really. Me? I make a living as an astrophysics professor—using computer simulations, I study how galaxies, supermassive black holes and galaxy clusters formed out of dark matter, baryons, dark energy. I also occasionally get paid as a commercial photographer (editorial and still life) and yes, fine, if you point something dangerous at me, I will admit to a slight preference for Futura over Helvetica. I will also freely declare to love science, I enjoy art, and I've been known to run a half-marathon in well under two hours.

Why mention running? Commercial photography? I like making connections, seeing things or people in different ways and improving on what I did the day before. I enjoy trying as hard as I can, and I do not mind the occasional failure. (Liar. I do, immensely, but I pick myself up and move on.) I find pleasure in repetition, in dwelling on details, be it a Photoshop tool, a math formula or a training routine. I often shift from one interest



Artwork: Fabio Governato

to another over the course of a day. The truth is, all these processes happen at the same time, and ideas seem to come to me at seemingly random moments. (An aside: I get stuff done by writing "to do" lists.

They do look funny though: Add supermassive black holes to galaxy formation model. Search for tall model for shoot. Change fonts—too big for science poster. Lop off four minutes from run time.)

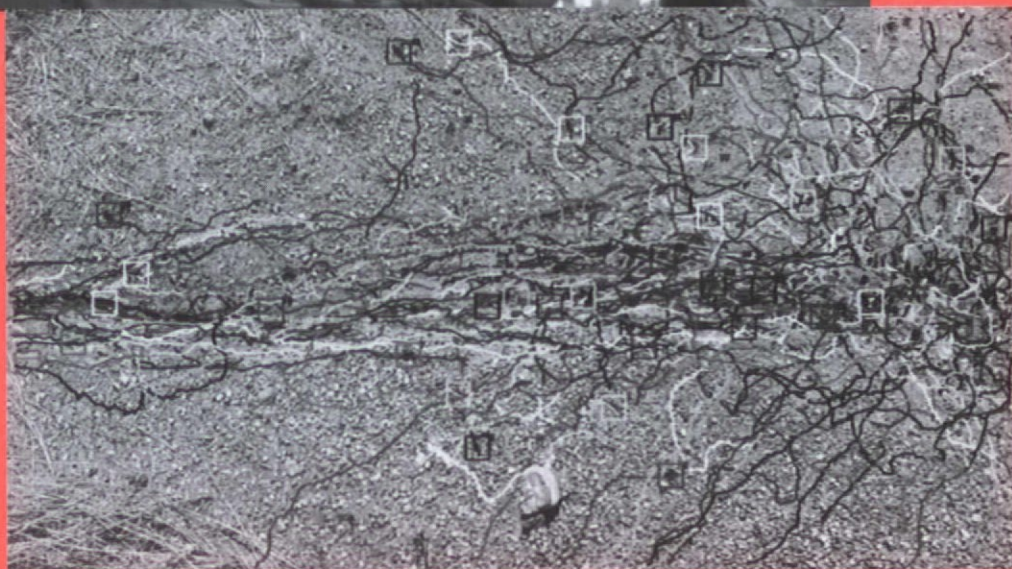
That is what I am getting at: Is there a difference between art and science? With designing a new typeface or understanding how galaxies form? Not much, I believe. None, if one is doing good science or good art. In both cases, you're trying to do something that hasn't been done before and, in the course of practicing all that is tedious, learn to do what needs to be done effortlessly, hopefully noticing that one little thing connects to another, which eventually takes you to some place new. Like a good run. ▲

Fabio Governato is a research professor at the University of Washington Astronomy Department. His main research field is cosmic structure formation. It is a rapidly changing, fascinating field that rewards a vivid imagination, attention to details and collaborative work.



Above: Deborah Gordon and Felipe Campos Cerda observing ants in the tropical forest at Chamela, Mexico. Photo: Courtesy of Deborah Gordon

Right: The trails of harvester ant foragers are captured by image analysis. Photo credit: AnTracks (antracks.org)



DEBORAH M. GORDON

Ants, it turns out, have much to teach us about the decentralized networks that operate in many biological systems, in which local interactions produce global behavior, without the guidance of any central intelligence or authority.*

The Art of Ant Watching

Ant colonies are fascinating because no ant is in charge or tells any other ant what to do. An ant uses only what it perceives nearby, mostly odor and vibration, to figure out what to do next. I study how the interactions of ants produce the organization of the colony. To do this, I watch ants and try to figure out what they are doing. At first I focus on function. Is the ant collecting food or building a nest? Then I ask how the ants work together.

Ants interact by touching antennae. Ants smell with their antennae, and when one ant touches another, it can assess whether the other ant belongs to the same colony. There are more than 11,000 species of ants. For at least some species, brief antennal contact is a cue to the task the other ant is performing. An ant uses these recent interactions to decide what to do. To understand how colonies work together is to understand what ants react to and how simple interactions produce the colonies' responses.

To learn about ants, I often count something, such as how often an ant met other ants. Sometimes I intervene to see how the ants react. Watching, thinking about how to interpret what I see, figuring out how to set up a way to measure what the ants are doing so I can find out if I'm wrong, finding out how to change their world enough to make a difference but not so drastically as to push them outside the range of ordinary behavior—this is the practice of science. It is both systematic and creative.

I think that science is much like art, except that science has formal rules that, we hope, allow us to work in a way that would lead anyone else who did the same thing to the same conclusion. The scientist seeks generality in results that can be

replicated. Good science is produced by practices that set an agreed standard for what is true.

I find ways to visually explore patterns that ants generate with their behavior. This process shapes my decisions about what questions to ask next. We use image analysis to trace the paths of ants. We can extract data from this visual information; for example, we can measure the flow of foragers by asking how quickly their paths pass an imaginary line across the foraging trail. The images also give a sense of the pattern created by the ants' paths, and thinking about these patterns raises new questions, which in turn require further data to answer.

Representations of nature in many forms – visual, mathematical and metaphorical – are all a part of the process of scientific research. Practicing science often involves making art, as making art involves experimentation. ▲

*Ant biologist Deborah M. Gordon has worked in the Arizona desert, northern California and tropical forests to decipher the chemical, genetic and behavioral codes of ant colonies. Gordon, a Stanford professor, wrote the acclaimed books *Ants at Work* and *Ant Encounters: Interaction Networks and Colony Behavior*, outlining her discoveries in generous, nontechnical detail.*

*Deborah Gordon, *Boston Review*, 2010

LUCY SPELMAN

Vets who work with wild animals also spend as much, if not more, time observing their patients than they do actually examining them. I love this part

of my job because it requires a combination of imagination and critical thinking.

The Art/ Science of Zoological Medicine

Art is more than the materials used to make it, just as science is more than facts. In both, the creative process is vital.

In my field, zoological medicine, anything is possible: glue-on shoes for a rhino with sore feet, an ultrasound for a gravid komodo dragon or a silica gel shake-and-

*Lucy Spelman is one of a handful of veterinarians certified in zoological medicine. Her patients have included giant pandas in China, Asian elephants in Burma, giant river otters in Guyana and mountain gorillas in Rwanda. She is also a writer and an educator with a keen interest in exploring new ways to use the arts to communicate and interpret science. In 2008, she published her first work of creative nonfiction, *The Rhino with Glue-on Shoes*, a book of 28 short stories. Currently she teaches biology at RISD and is a member of the Karanambru Trust Board of Trustees in Guyana, South America.*

bake treatment for a mite-infested cockroach. With 1.3 million species and counting, I learn something new each day. I look things up often, talk to colleagues and extrapolate. A tiger is cat-like, most frogs are similar, seed-eating birds differ from fruit-eating ones.

Vets who work with wild animals also spend as much, if not more, time observing their patients than they do actually examining them. I love this part of my job because it requires a combination of imagination and critical thinking.

From a distance, using binoculars, I watch a female mountain gorilla limp along. I imagine the explanations: sprain, strain, fracture, wound, snare. From her expression, she is in pain. I interpret her clinical signs by comparing them in my mind to other patients. I ask the trackers what they think. If it's a snare, she could lose a limb or even her life. There could be a piece of wire or rope encircling her leg, buried beneath her thick black hair.

Wild mountain gorillas are so rare that they have their own veterinary team, but we intervene only when humans cause the injury or illness. If she improves without treatment over the next few days, the diagnosis is less likely to be a snare. Medicine, like art, is iterative.

Sadly, my profession is faced with a much bigger challenge than a limping gorilla: Our patients are disappearing. The current rate of species extinction is at least one-thousand times higher than ever before. We are in the sixth mass extinction, and humans are driving the change.

Solutions to biodiversity loss require the informed actions of many. Unfortunately, only one-third of Americans are science literate, meaning they are capable of making a decision based on scientific information.

Teaching biology at the Rhode Island School of Design, I work with students interested in the many ways humans interact with animals. I hope to inspire future artists and designers to increase their science literacy—and then use their work to help others. By exploring new ways to stir emotions, raise awareness and stimulate debate, we have an opportunity to change the way science is communicated. The animal kingdom depends on it. ▲



Above: Mountain gorilla family in Rwanda.

Left: Asian elephant calf in Myanmar.

Photos: LH Spelman

MARINA MCDUGALL

Art, for us, is an open-ended process of investigation, speculation, imagination and experimentation.

Exploratorium as Laboratory and Studio

The world that surrounds us, that forms us and that we in turn shape, arrives as a complex, layered whole without disciplinary boundaries. A tree, for instance, embedded in its environment, comes alive for us as we experience it through our senses and animate it through the insights, tools and methodologies of various disciplines. We understand an apple tree very differently when we experience it through drawing than through cooking or climbing or when we explore it through the various lenses of agriculture, ethnobotany, organic chemistry, ecology or literature.

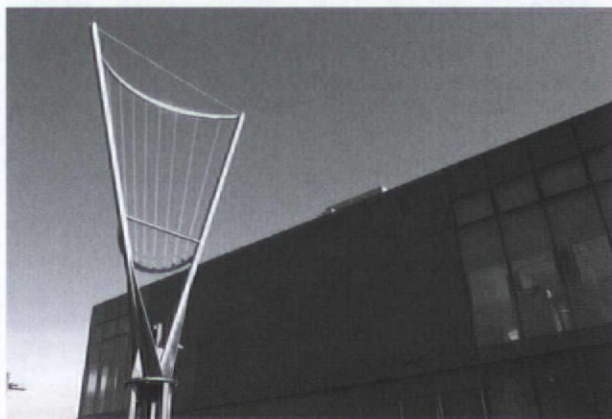
At San Francisco's Exploratorium, a hybrid between a laboratory and a museum, we think of both science and art as forms of inquiry. The term "art," like "science," means many things. The words simultaneously connote a culture of practice and the artifacts of that practice. While the term "art" evokes painting, dance and sculpture, "science" conjures notions of research findings, published papers and breakthroughs. Yet both art and science are, at heart, processes of investigation, using tools and methods for exploring and framing questions.

Founded by physicist and educator Frank Oppenheimer in 1969, the Exploratorium has recently moved to a new location at Pier 15 on San Francisco's downtown waterfront, where we have reopened with renewed conviction that art is vital to learning. Our new Center for Art and Inquiry is a research and development center for the arts within the larger learning laboratory of the Exploratorium. The Center oversees our

trailblazing artist-in-residence program, hosts symposia and develops dynamic research projects in the arts. Some 40 projects – including large-scale immersive installations, site-specific interventions and classic exhibits developed by artists-in-residence collaborating with Exploratorium staff – will be on view throughout the new site.

Artists have shaped the approaches and learning culture of the Exploratorium from its founding and have inspired our view that a cross-disciplinary approach to understanding

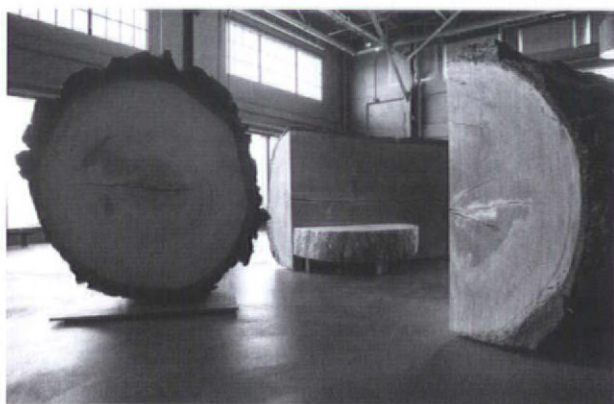
the world is essential to furthering insight. Art, for us, is an open-ended process of investigation, speculation, imagination and experimentation. The results of artistic inquiry can take infinite form, especially since every artist seems to reinvent art practice anew. The subject, question or issue engaged, as well as the final manifestation of a work propel artists down different paths. Take, for example, two current Exploratorium artists: Fujiko Nakaya's artistic investigation necessitates her understanding of the complex conditions that produce fog, as she works with meteorologists, engineers and computer programmers; Jane Wolff, a landscape architect with a background in documentary filmmaking,



Aeolian Harp, Doug Hollis, 1976—re-sited in 2013. A 27-foot-tall harp that is strummed by the wind. Photo: Amy Snyder © Exploratorium



Fog Bridge #72494, Fujiko Nakaya. This temporary installation stretches across the 150-foot-long pedestrian bridge that spans the water between Piers 15 and 17 in San Francisco. Water pumped at high pressure through more than 800 nozzles lining the bridge creates an immersive environment shrouding the structure in mist. Photo: Gayle Laird © Exploratorium



Big Wood: 300 Years of Photosynthesis, Michael Brown and Evan Shively, 2013. A several-hundred-year-old Douglas fir was split down the center to reveal its rings, presenting a fascinating study of dendrochronology. Photo: Gayle Laird © Exploratorium

explores the hybrid landscapes that emerge from interactions between natural processes and cultural intervention at the edge of the city and water. Her project *Bay Lexicon* reveals how language shapes our understanding and perception of place.

At the Exploratorium, scientists also borrow upon the methods of art to create arresting experiences for the public. For instance, Kristina Yu, the director of the Exploratorium's Living Systems Department, is a biologist who values the way in which powerful aesthetic experiences intrigue and motivate learning. Yu worked with artist Michael Brown and reclaimed-wood specialist Evan Shively to develop the exhibit *Douglas*. A several-hundred-year-old Douglas fir was split down the center in order to reveal its rings and immerse visitors in a fascinating experience of dendrochronology. The wood of the tree forms the walls of a contemplative space. The tree's enormous, lacy root structure inspires visitors to appreciate the complexity and sheer enormity of this grand, once-living organism.

Some of the most compelling contemporary ideas emerge at the interstices of fields and cultures. As a laboratory that develops learning experiences for the public, we form multidisciplinary teams that draw upon the methodologies of both art and science (and many other forms of expertise) to develop diverse offerings that inspire curiosity. At the Exploratorium, as in culture as a whole, collaboration is essential for approaching complex, layered subjects from multiple perspectives.

The Exploratorium believes that inquisitiveness underlies active participation in the world and that an inquiring public benefits society. We see our mission as helping others to rediscover their own curiosity; one doesn't need to look far to find people who, whatever their walk of life or vocation, are animated by a happiness borne out of deep engagement with their surroundings, their communities, their skills and talents. All of us working in American education today (whether as parents, teachers, writers, museum professionals or policy makers) know that learning needs to be varied in texture to resonate and take hold deeply. Both art and science as processes of inquiry are essential aspects of this. ▲

Marina McDougall is an artist and curator with an interest in the intersections of art and science, nature and culture. She has organized exhibitions and public programs for the Museum of Jurassic Technology, MIT Media Lab, the California College of the Arts Wattis Institute for Contemporary Arts (where she was curator of art and design) and the California Academy of Sciences. Marina is a co-founder of the Studio for Urban Projects, an arts collaborative with a storefront in San Francisco's Mission District that incubates new ways of reimagining and reinventing the city. She is an adjunct professor in the CCA Graduate Program in Curatorial Practice.

ROB KESSELER

Working with scientists, I am often asked about the definition of art, so I devised one that drew upon descriptors that would be familiar to them.

Convergent Territories

A Definition of Art for Scientists

Photography: Rob Kessler

To move into another's territory, to engage with their discipline in a way that goes beyond the superficial and poorly informed, to explore areas of commonality and difference is a privilege. As someone who failed science courses at school, there is a sense of self-inflicted irony in that I now spend time as an artist working with scientists, including plant morphologists, cell biologists, bacteriologists and geneticists. Perhaps because of these collaborations, an essential part of my practice is to learn as much as I can about the fields in which I enter. By doing so, I look to enable meaningful, equal

exchanges and create work that transcends superficial appropriations of methods and images.

While giving a presentation of my work at the start of a recent fellowship with the Gulbenkian Science Institute in Portugal, I was asked for my definition of art—what did I tell my students when they asked? The audience was surprised to hear that it was not a question that often came up; there is no agreed upon classical description. And the

question did not go away. Working with scientists, I am often asked about the definition of art, so I devised one that drew upon descriptors that would be familiar to them. It went something like this:

Art/Science is both a process and a product, a way of examining the world through a series of filters chosen by the artist to be used in any combina-

tion and in varying strengths. These may be called **Receptor Filters**.

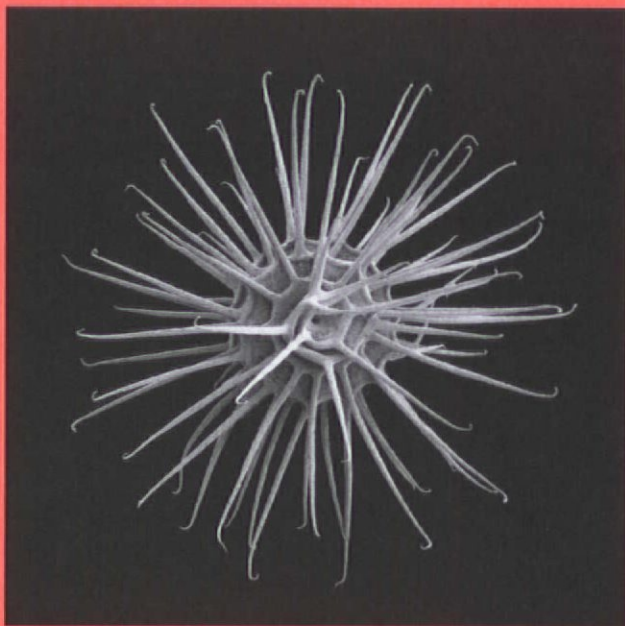
The information gathered through this process is translated through a further set of filters, **Expressor Filters**. To the by-product of this **Morphogenetic** process we may apply the label **Art/Science**. It exists for single or multiple audiences and across a range of diverse contexts.

The **Artist/Scientist** may be observed working in a personal laboratory on controlled experiments and may at any time “knock out” any filters to observe and record the effect on the art object/scientific data. The output is processed and recorded in various media for reference and dispersal.

The final filter is the **Audience**, which for art is drawn from a pool of collectors, curators, critics, writers and general public that reviews, responds, manages access and defines value. For science, this shifts to journal editors, funding councils, research directors and defines its scientific import. This may be called the **Phenotype Filter for Transcriptive Selection**.

By defining art as such, my practice may be considered both an art and a science. ▲

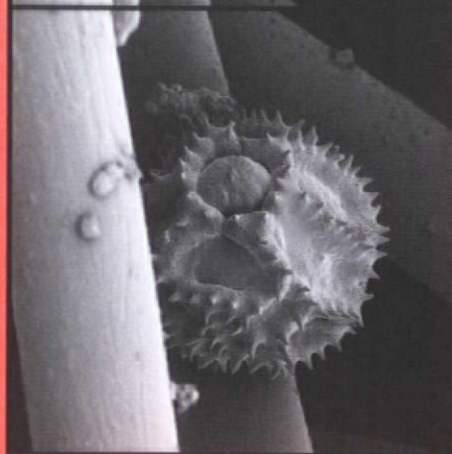
Rob Kessler is an artist and professor at Central Saint Martins, University of the Arts London. A research fellow at the Gulbenkian Science Institute, Portugal, he exhibits internationally. His books on pollen, seeds and fruit are published by Papadakis, London. For his contribution to plant imaging he was recently made fellow of the Linnean Society and fellow of the Royal Society of Arts. robkessler.co.uk



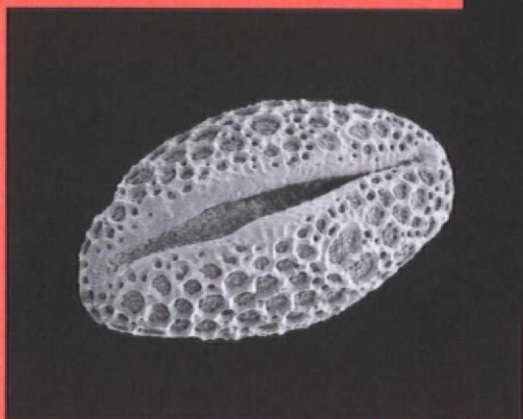
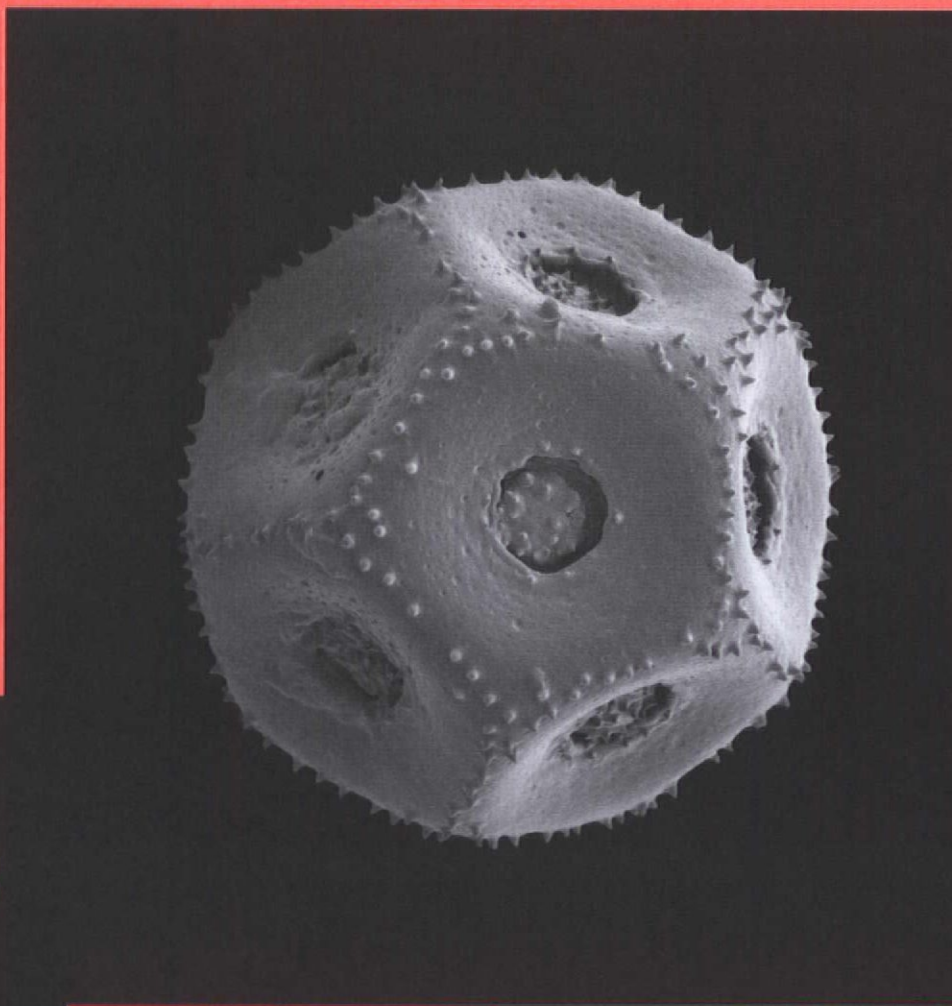
Above: *Medicago minima*, bur medick. Seed, hand-colored micrograph, 2013.

Right: *Stellaria holostea*, greater stitchwort. Pollen grain, hand-colored micrograph, 2011.

Below: *Salix alba*, white willow. Pollen grain, hand-colored micrograph, 2010.



Above: *Hortus in transit*, Hieracium. Pollen, hand-colored micrograph, 2008.



KEN YOCOM

When positioned as two agents within a single system of inquiry, science and design create a syncretic approach to clarifying reason, generating perspective and challenging intellectual stasis.



Science, Design and Innovation

A Sustainable Development Perspective

As faculty in a design department, I am often asked if creativity can be learned. In short, the answer is yes, but it is something gained through an individual's capacity to critically challenge conceptions of what is possible, what is right, what is wrong and what lies in between. Often this challenge emerges from a recognized disjunction between what is known from a scientific perspective and what is experienced in the world around us. In this regard, I appreciate the metaphor that relates the flash of a light bulb to the realization of a good idea. It is in this instant when transformation occurs, perspective shifts and the capacity for creativity and insight is ripe. We all experience this moment when a complex idea that was discombobulated becomes clear. This clarity leads to innovation for it is at such times when people craft the most interesting things—things that change our experienced worlds, capture our most vivid moments and guide us through the grind of the everyday. Derived from the Latin verb *innovare*, meaning to reform, to innovate is to initiate a process of renewal and change. It differs from invention in that it refers to an idea or method that is novel but not new. It is the reappropriation of existing knowledge to address complex issues and meet contemporary needs.

Trained as an ecologist and landscape architect, I seek innovative strategies and design concepts that have the potential to foster healthy and sustainable communities through the engagement of the arts and sciences. Ecologically-based design is a diverse, dynamic and constantly emerging practice, often two steps ahead of public understanding and one step behind public need; developing good models for incorporating new strategies into the design of built environments is therefore critical. It builds on the structured approach of science that relies on empirical verification to generate understanding, while also utilizing the less syllogistic methods of design to test those ideas through speculation and improvisation, and, among other things, engage the emotive and aesthetic qualities



Rendering from a design studio course examining the future management of the Maury Island Marine Park. Image: B. Helen Perry



EnVitrum's structural masonry, made from 95% recycled glass, supports plant growth by enabling the movement of water through capillary action.
Photo: EnVitrum

of place. In short, ecological design is a strategy that builds from an experimental approach that draws on science to inform design and design to challenge scientific understanding.

A collaborative studio course I recently taught integrated students from the sciences and landscape architecture to link core ecological concepts, creative forays and technology to encourage an experimental design focus for envisioning the community and recreational potential for the Maury Island Gravel Mine Park, a 236-acre area of land adjacent to the largest marine reserve on the shores of Washington's Puget Sound. The site, physically altered from decades of surface mining, and with soils made toxic from the airborne effluent plume created by a nearby smelter, offered a remarkable chance to explore how we might improve environmental conditions and recreational opportunities at the same time. The students struggled to embed scientific understanding and site design strategies into their proposed design and management program. They wanted to build a platform for modeling collaboration between scientists, designers, planners and community members. When informed by community input, the students responded in an innovative manner, prioritizing land reclamation practices in a phased approach that reengages natural processes over time in ways that would improve on-site conditions, as well as surrounding terrestrial and marine environments. What was truly innovative in their work was the careful integration of community involve-

ment and education in the generation and analysis of scientific information to inform the management process.

A more material response to the integration of science and design is seen in the novel process-technology developed by two scientists at EnVitrum that utilizes up to 95% waste glass to create a structural masonry product exceeding the performance capacity of traditional materials. Innovative in its reuse of materials, this product also has an internal structure containing a diffuse network of interconnected micropores that enables the movement of water through capillary action. This material can cool buildings through evaporation of collected water, while also serving as a medium for plant growth, opening new pathways for integrating green roof and

wall technologies into everyday building. While the creation of the material is important, innovative potential emerges from the ways in which architects and designers will use it to extend the exploration of green building technologies and the making of places for people.

When positioned as two agents within a single system of inquiry, science and design create a syncretic approach to clarifying reason, generating perspective and challenging intellectual stasis. Together they promote innovative thinking and action, building complementary and iterative processes that shape productivity and have the capacity to reframe social perspectives. It is in these moments of clarity, between on and off, that we must embrace the flash that ignites innovative ideas and work to develop solutions that strengthen our resolve to accept change and build resilience within our communities. ▲

Ken Yocom teaches in the landscape architecture program at the University of Washington. Ken received a bachelor of science in vertebrate zoology from Eastern Washington University (1996) and a master of landscape architecture (2002) and a PhD from the Program in the Built Environment UW (2007). Ken's research and teaching explores the intersections between the ecological sciences and the design and management of landscapes. He views the activities of the allied design professions as catalysts for identifying, understanding, designing and managing the inherent potential found within our built environments.

DANIEL FRIEDMAN, ANDREW DANNENBERG
AND HOWARD FRUMKIN

Evidence-based design across scales can promote health while yielding manifold co-benefits: physical activity, disaster resiliency and sustainability.

Design and Public Health

Working Hand-in-Hand for Better Built Environments

The human condition is changing rapidly. The last century brought unprecedented shifts in the ways we obtain and use energy, communicate, travel, eat, work and raise our children. From the metropolitan scale to that of rooms and products for everyday use, many of the features of our environments today would have been unimaginable to our early forebears. The flows and cycles of energy, carbon, nitrogen and other materials, and the systems that undergird the earth's functions are also quickly changing.

While we are a highly adaptable species, we are showing signs of stress—high burdens of depression and anxiety, cardiovascular disease and cancer, attention deficit and autism spectrum disorders, asthma and infertility, many of these trending in the wrong direction. The built environment offers many opportunities to mitigate this stress through both art and science. From a design perspective, this presupposes the integration of empirical evidence with traditional form-driven problem-solving methodologies. Evidence-based design across scales can promote health while yielding manifold co-benefits: physical activity, disaster resiliency and sustainability.

PROMOTING PHYSICAL ACTIVITY

The public health community is increasingly concerned about the current “syndemic” (or conjoint epidemics) of sedentary lifestyles, overeating, obesity and associated diseases—hypertension, diabetes, heart disease, stroke and some cancers. Routine physical activity appears almost diabolically engineered out of our daily lives. Roadways favor motor vehicles, not pedestrians; grand buildings feature iconic

elevators in their lobbies, while stairways remain hidden behind fire doors.

Working together with public health professionals and planners, designers can help remedy what urban theorist Nan Ellin calls “place-deficit disorder,” starting with the basics – stairways, sidewalks, landscapes and contiguous urban spaces – which they can compose to attract greater pedestrian use. Grounded in empirical research, the *Active Design Guidelines: Promoting Physical Activity and Health in Design*, produced in 2010 by the AIA New York and the New York City Department of Design and Construction, describes principles of building composition and spatial organization that increase physical activity across all income levels and generations. This and many other emerging initiatives exemplify the potential for good design to promote healthy places through the use of scientific knowledge.

DESIGNING FOR RESILIENCY

The devastation left in the wakes of Hurricanes Katrina and Sandy – among the largest, deadliest and costliest storms in US history – underscores threats posed by extreme weather events, rising sea levels, flooding, storm surges, heat waves and droughts. Such disasters



destroy property, displace people, fracture communities and upend lives. Evidence-based design can help reduce vulnerability and enhance the resilience of buildings and infrastructure, but most importantly, the communities who depend on them. Design strategies for water management include reducing water use, increasing rainwater capture and water reuse, conserving water during shortages and controlling water during surges and floods, as well as optimizing the recreational and aesthetic value of waterfront development.

SUSTAINABILITY

Sustainability is an aspirational goal—an equilibrium state in which human needs are met equitably, within the carrying capacity of the earth and without threatening the ability of future generations to meet their needs. The journey to sustainability offers the hope of continuity and security. Designers possess the unique skills, knowledge and practices to specify the use of benign materials across scales based on life cycle analysis, energy conservation, carbon management, and environmental and health impacts. As designers expand these practices, they educate their clients, inform the public and shift the market.

INCREASING OPPORTUNITIES EQUITABLY

Many of the factors affecting human health and well-being, whether short-term and measurable (e.g. obesity and asthma) or long-term and elusive (e.g. hope for the future), occur inequitably among persons with different income levels. Concerted efforts to address social and health disparities can help achieve fairness. Recent studies demonstrate that links between greater access to green space and lower mortality are more pronounced among the poor than the wealthy. Housing initiatives that offer better homes for low income persons,

workplace design that protects workers, and universal design that improves access for activities by persons with disabilities—these practices benefit vulnerable populations and offer designers unlimited opportunities to help foster fuller, healthier lives.

A GROWING MOVEMENT

Many in the building and design fields are increasingly focused on public health. Activity is growing around the intersection of design and human health in the form of a broad-based movement comprising diverse organizations such as the US Green Building Council, the American Institute of Architects, the Healthy Building Network, the National Center for Healthy Housing, the Center for Active Design, Public Interest Design and Practice Greenhealth, among numerous others. Working together, such organizations can disseminate information about existing and emerging programs of research linking design and health, sponsor initiatives and competitions that explore their interdependence, and underwrite programs that integrate them within the professional curriculum. New partnerships can help expand knowledge and hybrid methodologies. As the public learns about the health consequences of products, buildings, landscapes and urban development, the market for evidence-based health-elevating design will continue to grow.

“Instead of sacrificing the present for the sake of the future,” *New York Times* columnist David Brooks recently wrote, “Americans now sacrifice the future for the sake of the present.” In counterpoint, we envision an emerging alliance of design professions working together with public health professionals toward a sustainable future with unprecedented measurable effectiveness across scales—focused on life cycle and resilience, oriented toward enduring responsibility, and imagining a future where the opportunity to achieve health and well-being is a fundamental human right. As the combined resources of allied disciplines further converge around new calls to action, we see a future for professional education and practice mutually empowered by design insight and empirical evidence to create and improve healthy buildings, neighborhoods and cities that elevate, optimize and advance human potential. In offering this picture, we remain soberly mindful of the costs of inaction—costs here and now, costs across the life of our built environments, and most importantly, costs passed on to future generations. ▲

Andrew Dannenberg, MD, is affiliate professor of Environmental and Occupational Health Sciences in the University of Washington School of Public Health and affiliate professor of Urban Design and Planning in the UW College of Built Environments. Howard Frumkin, MD, is dean of the University of Washington School of Public Health, and Daniel Friedman, PhD, is a licensed architect, professor and immediate past dean of the UW College of Built Environments.

CHARLES MUDEDE

If one sees humankind from the perspective of neoteny, from wonder and play, then art begins to assume a very central role in the development of our species.

The Art Animal



Deep in the mists and thickets of James Joyce's *Ulysses*, his practically unreadable novel (or whatever that thing is called), you will find a marvelously meaningful sentence that glows like a translucent egg in a nest: "It darkles, (tinct, tint) all this our funnaminal world." Focus on the word "funnaminal." If it weren't almost completely unknown by the reading public, it would be recognized as one of Joyce's greatest contributions to the English language. Funnaminal is like a dub tune. It echoes and ghosts these other words: phenomenal, fundamental, animal and fun. From the portmanteau "darkles" (dark and sparkles) emerges

the phenomenal human, the human animal, the fundamental human and the fun animal. But here is the thing that Joyce's genius reveals: We know the human has an appearance (phenomenal), that it is a part of the tree of life (animal), and we also know that the human is made of matter, of carbon, nitrogen, oxygen and other heavy elements that were forged in stars that, when reaching the end of a sequence, exploded and had their nuclear-fused contents spread across vast areas of space (fundamental). But what did Joyce mean by the fun animal? Why is having fun as important as appearing, living and mattering?



The human is the animal that extends the attributes of childhood into adulthood. Called neoteny, this is one of the important keys to our success as a species. What this means is we are the animal that never really grows up and, as a consequence, never stops doing two things: playing and wondering. But how could this turn out to be an advantage and not a disadvantage? Yes, playing makes evolutionary sense for a child because it's a great way to learn how to do things like an adult. Also, wonder makes evolutionary sense for a child because it leads to questioning things, which leads to learning new behaviors and concepts. But shouldn't we stop wondering and playing and get on with life? This makes a lot more sense.

The science writer Ed Yong for the *National Geographic*:

The evolutionary process called "neoteny" [is] where a species' growth slows down to the point where adults retain many of the features previously seen in juveniles... [S]ome scientists, like the late Stephen Jay Gould, have suggested that neoteny has played a major role in human evolution too... A slower rate of development may even have shaped our vaunted intelligence, by stretching out the time when we are most receptive to new skills and knowledge.

And that is the advantage. We don't stop learning. At a certain point, chimpanzees do stop wondering and, for the most part, playing, and begin to accept reality as not a game but world with hard facts—they become adults. Humans just don't. After we've figured out the basic aspects of reality, we continue to wonder about the stars, about why they are bright, why they explode and what happens to all of that exploded stuff. We then go on to learn that some of this stuff forms other stars and worlds, one of which happens to have an animal on it that lives to learn.

If one sees humankind from the perspective of neoteny, from wonder and play, then art begins to assume

a very central role in the development of our species. Art is, after all, childish. It really makes no intuitive sense for an adult to be interested in drawing, dancing and making sounds that have no direct meaning or recognizable reward. But a deeper look at our practices and behaviors reveals many unexpected things. For example, there is a good chance that human reason's greatest tool and the very ground of possibility for science – language – got its start as music. This is not a controversial idea. Indeed, it was famously proposed by Charles Darwin in *Descent of Man*. But Darwin,

admittedly, saw it as a product of sexual selection. And it does not end there. The sociobiologist Geoffrey Miller believes that the art of language, rather than hunting and other practical activities, is behind the rise of the human brain. He argues that a big brain, which is very expensive to maintain (demanding up to 25 percent of our daily caloric intake), is not needed for almost all of our basic needs. We could do very well with a gorilla-sized brain. So where did this big brain come from? He thinks it was sweet talking and poetry. In short, the brain is a sexual ornament. The brain, the source of so many spectacular mathematical and rational achievements, was driven to its incredible size by the need to entertain, to keep a story going, to make more and more glittering strings of words.

Knowing all of this, knowing that art and the imagination played such an important role in the rise of the human animal, and knowing that human reason cannot be separated from human creativity, the nineteenth-century German philosopher Friedrich Nietzsche wrote:

Nothing is more incomprehensible than how an honest and pure urge for truth could make its appearance among men. They are deeply immersed in illusions and dream images; their eye glides only over the surface of things and sees "forms"; their feeling nowhere lead into truth...

The answer? It was provided by another German philosopher, Hannah Arendt: "As far as philosophy [the mother of all the sciences] is concerned... it begins with wonder." ▲

Charles Mudede writes about film, books, music, and his life in Rhodesia, Zimbabwe, the US and the UK for The Stranger. He is also a filmmaker: Two of his films, Police Beat and Zoo, premiered at Sundance, and Zoo was also screened at Cannes. Charles has written for the New York Times, Cinema Scope, Ars Electronica, C Theory and serves on the ARCADE Editorial Committee.

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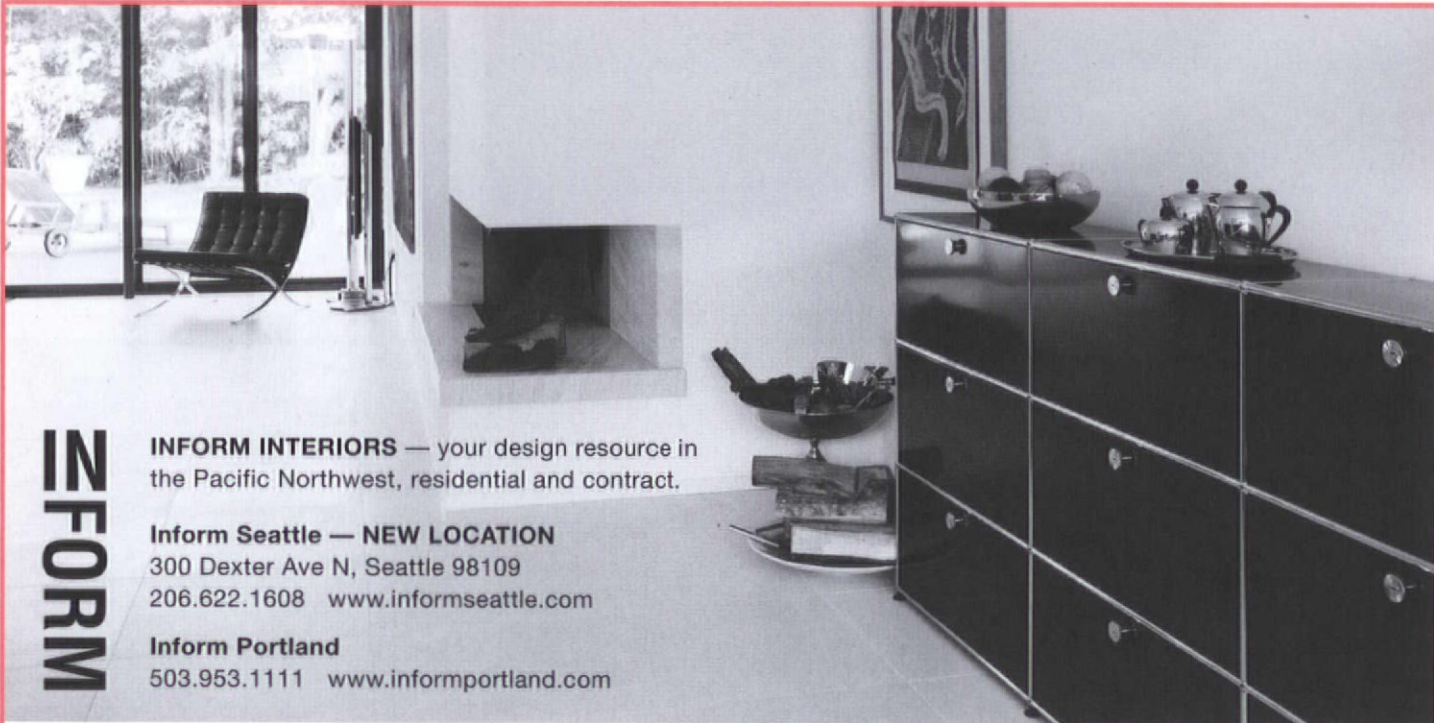


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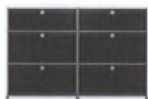
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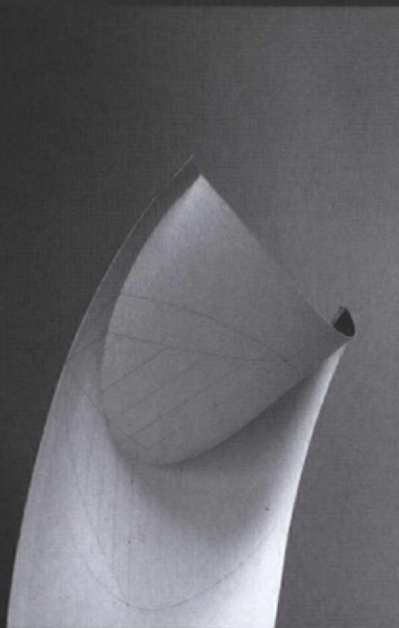


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PRACTICE

A Quantity of Quality

An Interview with Stanley Saitowitz

BUILD IIc

This last spring, BUILD met with Stanley Saitowitz at his San Francisco studio to discuss his current workload, the challenges of Modernism and bringing good design to the people.

BUILD: You and your team of architects are true generalists, designing everything from single-family residences to skyscrapers. How is your office organized to do so?

Stanley Saitowitz: Our work is strategic, and it's modeled on an idea of architecture that relates to someone like Mies van der Rohe. Rather than reinventing everything every time, we're in a process of evolution and refinement. We also have a small office where we work efficiently and the work is well directed. We don't do alternatives, try things on for size or have beauty contests. It's a studio of focused thinking, and we're a good machine.

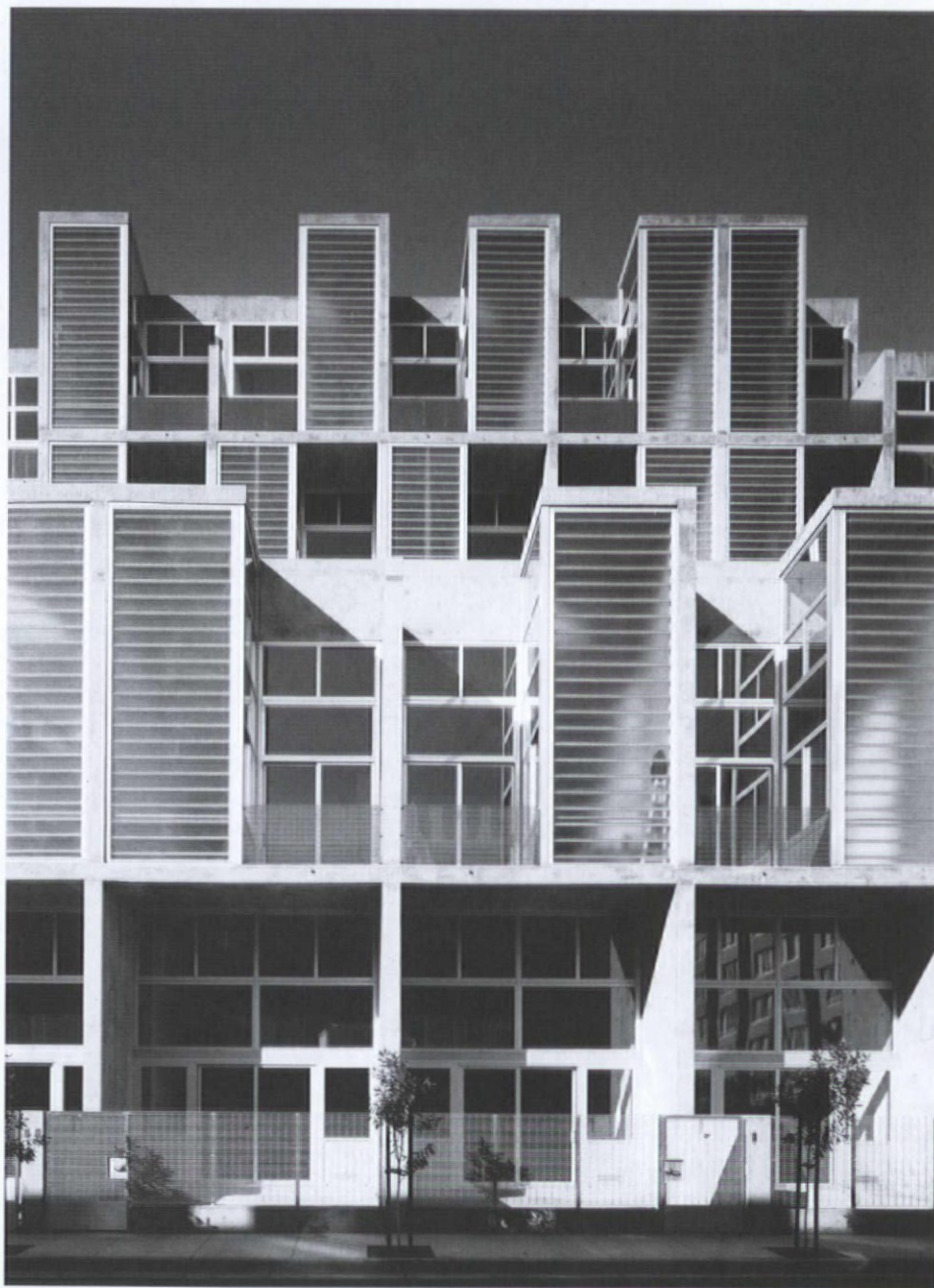
What is your experience working with the stringent historic preservation codes in San Francisco?

It's the reason that we've been driven to look for work elsewhere. As an example, the Octavia Gateway project of ours in San Francisco was designed seven years ago. The site is virtually unchanged because the approval process has been stalled by a discussion of minutiae. In another seven years I'll be 70, and I just don't have the time for these absurd situations. You don't have so



Octavia Gateway, San Francisco, CA, 2007. Rendering: Natoma Architects





Yerba Buena Lofts, San Francisco, CA, 2002. Photo: Tim Griffith

much life that you can waste seven years trying to build a 50-unit structure.

San Francisco has a way of absorbing mediocrity. A nebulous design gets much less attention here, and subsequently, there's less resistance to it. Unfortunately, our work seems to be a lightning rod for resistance, and it's not easy for us to get projects through the approval process. The projects don't get any better because of this process, either. Everything has become so complicated and

tedious; there are so many checks and balances that I'm surprised anything decent gets built. These processes are making it more and more impossible to do good work.

Where do you like to work outside of San Francisco?

Miami Beach is a great place to work because it's a city that embraces Modern architecture, unlike San Francisco, where every building is meant to be Victorian. The area has this kind

of exuberant tropical Modernism, and we're trying to work out of this language and reinvigorate this tradition in a contemporary way.

You're also doing a significant amount of work in Cleveland. Can you tell us a bit about the work you're doing there?

The project is a real piece of the city's fabric. Old Cleveland has all these amazing buildings, but the city has lost a third of its population, so they are mostly empty. We're currently converting eight floors of one of these old buildings into housing, and it's the best housing we've ever done because of the quality of space. The 12-foot ceilings and massive windows make for really beautiful units; you can't build like that anymore. Also, the work we're doing in Cleveland for \$150 per square-foot would cost about \$250 per square-foot in San Francisco.

How did you achieve the simple elegance of the mixed-use Uptown project in Cleveland?

We compressed all of the services like mechanical, electrical and plumbing into a service bar that runs along the spine of the building. This service bar resides in a dropped ceiling adjacent to the hallway. All of these service bars line up among units; the geometry is then mirrored on the opposite side of the hallway to create what we call a double-loaded corridor. Once you move past the service bar in each of the units, there's nothing to get in the way of the windows and high ceilings. It's cheaper to build this way because everything is so rationalized, and it's a simple design process.

You once likened good architecture to Levi's jeans, meaning that the right approach should have an application to the masses. Do your larger developments with repetitive plans speak to this?

Yes, many of our projects of this scale incorporate the same strategy using the service bar. Our work aims to be a blank slate; it tries to be deprogrammed and indeterminate. What we try and do is make a quantity of quality. This is why I have such a dislike of most of the housing in San Francisco. The houses are based on the Victorian model, and they're unlivable. All the rooms are the same size, and they're all too small. They don't represent anything about the way people live today; they're uninhabitable.

The images on your website suggest a spartan lifestyle for the inhabitants of your projects. To what degree is this simple lifestyle intended?

I read this thing that the German architect



Yerba Buena Lofts, San Francisco, CA, 2002.
Photo: Tim Griffith

I'm trying to figure out ways to optimize everything and get the most value. That is, to get the biggest spaces, the best light, the most choice for the occupant. The method is pretty simple: compact all the expensive stuff, be rigorous about how it works and have the most open-ended space so that people can decide how to use it.

Ludwig Hilberseimer said, that the ideal urban house should be so well designed that all you need to do is bring your clothes, a chair and a table, and you could live there. And, in a way, that's what we try and do with our urban housing.

Is there a point in design at which the more minimal something seems, the more complicated it actually is under the surface?
I think some architects do find that threshold,

but we haven't. I'm not a design fetishist, and I don't really care about having the best costume jewelry. I was recently at an architect's office, and they were designing doorknobs. I couldn't be bothered with that; why not use the doorknobs that are already being manufactured? That's where I think there's a lot of waste. I have an appreciation of beautiful things, but I think machines are useful; I don't think you have to make everything by hand. I'd rather have a bigger room than a custom-made doorknob.

You believe that buildings that offer value and economy are a responsible way to build. How is the profession in general doing on this front?

I was in Germany recently and noticed the amount of resources they put into the quality of architecture there; they just spend more effort on their buildings. It's a little embarrassing to see the way we build in the United States. I don't want to make buildings cheaper; what I'm trying to figure out is how to best allocate the construction budget. I'm trying to figure out ways to optimize everything and get the most value. That is, to get the biggest spaces, the best light, the most choice for the occupant. The method is pretty simple: compact all the expensive stuff, be rigorous about how it works and have the most open-ended space so that people can decide how to use it.

Is there a particular project of yours that has achieved value with little waste?

The big success for us in housing was the Yerba Buena lofts because that building was a magnate, and it was built for the same price as all those Dryvit buildings out there. It was built in such a way that there wasn't any waste. With most buildings of this scale, you build a concrete structure and then you have people from seven or eight different trades wrap it up. Some of these buildings use a hideous amount of materials on the façade. With Yerba Buena, we just had concrete and glass, which involved fewer trades to complete the building. This freed up more funds to put better materials into the building—we were able to use channel glass, for instance. It was an exercise in figuring out how to manage resources more intelligently within the existing standards.

Many of your projects span entire city blocks; at what point does the project require you to think like an urban planner?

Often times, as the architect, we'll inherit the lot. The project may already be approved, the number of units may be fixed, the floor area ratio may be fixed, and the amount of parking

spots predetermined. We don't necessarily have to be planners.

Do you consider your work to be regional?

I'm not regional in terms of wanting to be a Bay Area architect; I consider our work to be multi-regional. Our basic interest is in place and the differences in places. In Berkeley I want to make Berkeley buildings, and in Toronto I want to make Toronto buildings.

What is your advice to architects about working with big developers?

If you can do what they want, which is to be efficient, they won't micromanage the design (at least not the developers we work with). We have much more freedom working with developers than with single-family residential clients, and it's much less tedious. While developers may not be directly interested in good design, they realize that the market is.

What is your advice to young architects starting their own practices?

Having built projects to show makes it easier for people to believe in your work. Having projects that people could see is what allowed me to get my start. I don't know how a young architect would even start a practice today; it's just so hard. I don't see anyone going out on their own anymore.

What's on your nightstand? What are you currently reading?

I recently finished *Community and Privacy* by Serge Chermayeff and Christopher Alexander, and I'm currently reading *Metropolisarchitecture* by Ludwig Hilberseimer. I read mostly to support my wars.

Stanley Saitowitz was born in Johannesburg, South Africa, and received his masters in architecture at the University of California, Berkeley. He has taught at numerous schools, including Berkeley, Harvard and Rice. His award-winning projects include residences, museums, libraries, wineries, synagogues and memorials. Three books have been published on his work, and he has given more than 200 public lectures.

BUILD llc is an industrious design-build firm in Seattle run by Kevin Eckert and Andrew van Leeuwen. BUILD llc's work focuses on permanence, sustainability and efficiency. BUILD llc maintains an architectural office, a cabinet shop and a development company and is most known for their cultural leadership expressed in frequent posts on their blog. blog.buildllc.com

CITY BUILDING VANCOUVER

Off-Grid in Z-Town

Trevor Boddy

Photography: John Sinal

On a 1980s writing trip after graduating from architecture school, I was led on a tour of suburban Mexico City projects by influential architect Ricardo Legorreta. Our last stop was a housing development called “Las Palomas”—make that potential development, as the hillside tracts planned there had been stopped in their tracks by the recession, with not a single house constructed. What Legorreta had been able to build was a series of monuments in coloured concrete inspired by his mentor Luis Barragan: a tall, azure cylinder; a train of low ochre terraces; an oversized, mustard-coloured wall with dozens of perches and cavities, a high-rise condo for pigeons. Legorreta caught my sense of amazement at these powerful shapes strewn over an almost empty landscape and said with a smile: “We Mexicans build monuments but never get around to the infrastructure. You Canadians build infrastructure but never get around to the monuments!”

I thought of Legorreta’s words upon arriving in Zacatitos, more a scattered collection of houses than a town, 45 minutes up a dirt road from Cabo San Jose at the southern tip of Baja California. Zacatitos has neither monuments nor infrastructure. There is no water supply other than weekly purchases off a truck, no streets other than shifting tracks through the cactus and dunes, no power lines, no sewer, no bus, not even a store—I have never before visited a Mexican *pueblito* with-

out a single *tienda*. There is no piazza other than the beach where desert meets the Sea of Cortez surf and nothing civic other than a forlorn gazebo, almost never used. Zacatitos is a gathering of second homes for a population that is one-third Mexican, one-third American and one-third Canadian, and they call it “Z-town.” It is also a wonderful place for fresh thinking about the nature of houses.

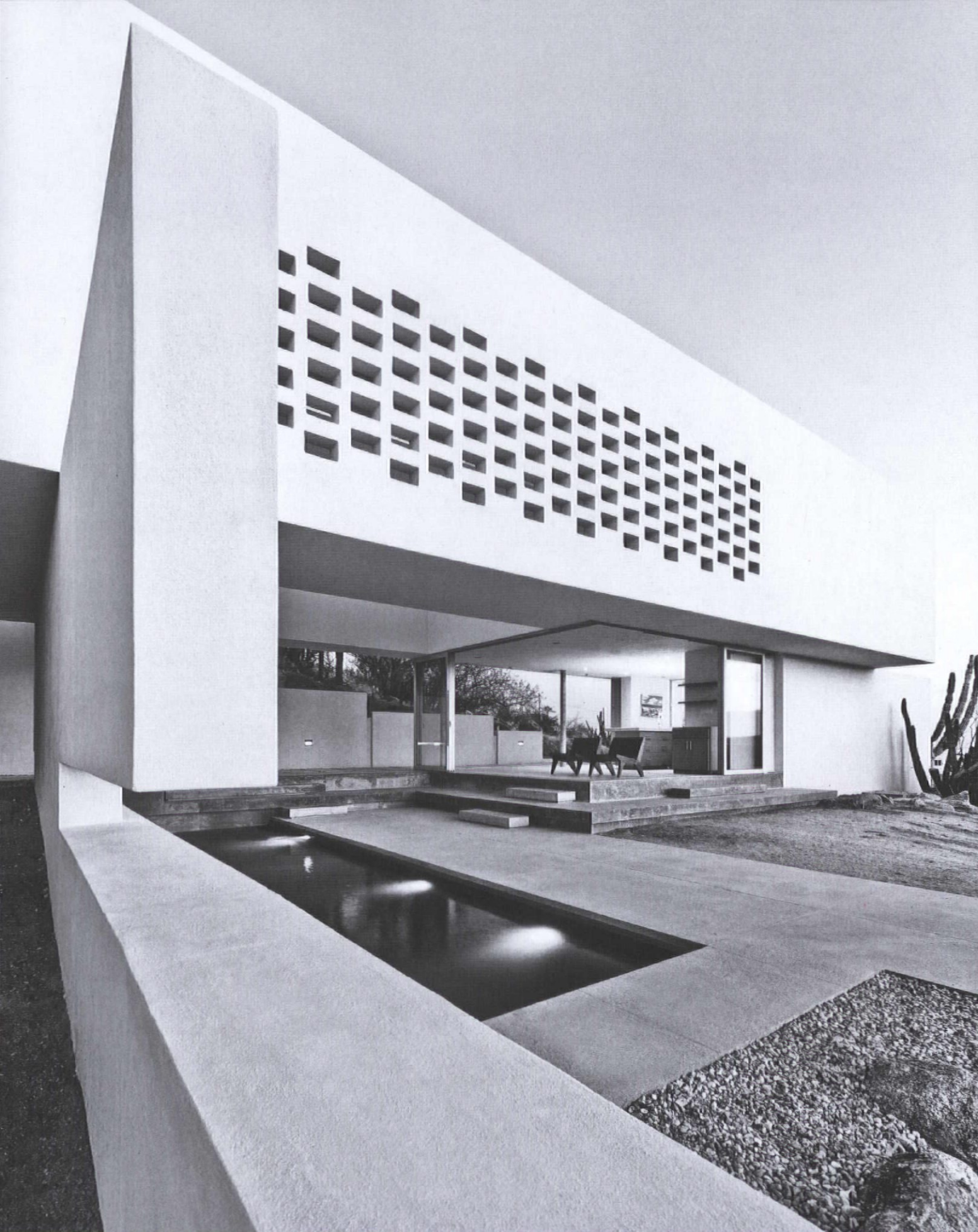
The most interesting Z-town constructions are all designed by Vancouverites Javier Campos and Michael Leckie. Over a decade, they have built four innovative and powerful seasonal residences there, all of them off-grid, and have now commenced work on a small resort nearby for a progressive Vancouver developer. We Canadians dote on infrastructure, investing fortunes in supplying full services to our new suburbs and heavily taxing new downtown development to create the social systems of parks, galleries and daycare. Canada’s planning is conservative, our tract developers controlling of facades and finishes, and our architectural culture rewarding of conformity. Off the grid, off the street and almost off the map, the Campos Leckie works in Zacatitos are refreshingly original, taking notions of inhabitation and environmental control back to their creative fundamentals.

Z-4: HOUSE FOR A NOVELIST

The most recent Z-town house by Campos Leckie is both the smallest and most assured.

The client is an author of romance novels in her 50s who pointedly asked her designers to shape a house to get away from writing, not pursue it. Accordingly, there is no writing or work room, just a master bedroom with a distant ocean vista, linked upstairs with a long corridor to a guest room with its own views into a cactus grove; this hallway is flanked by a south-facing masonry wall to collect heat away from inhabited rooms but perforated to provide breezes and patterned light. This long box on the sleeping level, with the bedroom windows at each end, is set on a supporting L-shaped wall backed into a small hill, with a second, largely cantilevered wall defining the entrance sequence beside it.

Upon arrival, one passes between the two walls, turns a corner at the elbow punctuated by potted cactus to enter into Z-4’s most important room, a courtyard-cum-lap-pool deck living space. Here the house’s subtle passive environmental control strategies come into focus. The space is shaded from the desert sun most of the day but admits buffered late sun, the orange-fire glow that ends every Baja day. These two entrance walls also catch and amplify even the tiniest of winds, drawing air across the pool to naturally air-condition the living decks and adjacent kitchen-dining room, with sliding glass walls that are pulled back in most times and seasons. A galley-style kitchen groups most services along the downslope wall, its line continuing to an outside main-floor bathroom





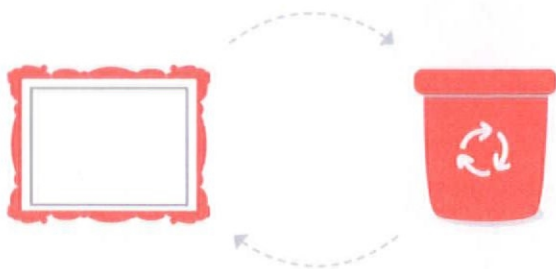
Off the grid, off the street and almost off the map, the Campos Leckie works in Zacatitos are refreshingly original, taking notions of inhabitation and environmental control back to their creative fundamentals.

and exterior shower/sink. This is matched at the far end of the house, on the same plan alignment, by a services unit for pumps, batteries and controllers for solar energy and water systems. With its electrical and hot water solar panels discretely deployed on the roof, and with its confident contemporary form-making, Z-4 is both infrastructure and monument.

The play of shadow and light around Z-4's poolside courtyard is a constant marvel, with primary and secondary shadows and reflections (some of them shimmering with pool-born waves) changing their angles and intensities by the minute, all through the day. The conceptual innovation of this modest house of little over 100 square-metres of enclosed rooms is that it pulls apart small-house functions into separated blocks and fills their gaps with light and wind, passively tempered by the presence of walls and choices of material. This is done by lifting the house's main mass above the ground and supporting it

with the two entrance walls at one end and the kitchen-dining pavilion at the other—a centrifugal strategy that creates livability at the heart of the plan. Studying Z-4's sections and energy diagrams confirms that the roofless courtyard is not a buffer or in-between zone but, rather, the most artfully composed room in the house. Campos Leckie have written that their Zacatitos houses are "devices to mediate and focus inhabitants' experience of the site." That this philosophy is combined with a simply eloquent repertoire of detail is doubly impressive, and in so modest a house.

Vancouver architecture critic and urbanist Trevor Boddy is editor of two just-released books: *Blue Sky Living: The Architecture of Helliwell and Smith* (Images Press, Sydney) and *Pools: Aquatic Architecture: Hughes Condon Marler Architects* (ORO, San Francisco).



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SIDE YARD

Addenda to *A Pattern Language*

Jane Radke Slade



In a foul DIY mood, I cracked open a copy of *A Pattern Language*. My sister maintains that Christopher Alexander and company will not only help me plan my kitchen remodel, but will change my life. Not familiar with their work? In the late 70s, they broke down urban planning and architecture into essential elements, such that anyone could create utopian cities, garages and window seats. I've become obsessed with this book and its train wreck of a graphics scheme, this strange set of mutually referring chapters illustrated with

what look like tiny black-and-white travel snapshots and back-of-napkin sketches.

Frustrated with designing my kitchen, I've instead made a game of rewriting the patterns to suit my family. Don't work too hard trying to understand the strange flow of Alexandrian paragraphs and fonts. Just get the gist of it and then join in with your own patterns.

74(b) KITTIES

...The pattern ANIMALS (74) contends that our humanized pets provide neither “emotional sustenance nor...ecological connections.” However, STAIR SEATS (125) and the ENTRANCE TRANSITIONS (112) both fall short without the presence of felines.

People say to pets what they long to say to each other.

Nobody can resist a kitty. Kitties on a front stoop invite the community to partake in a family’s affection without crossing boundaries of personal space. People ask inane questions of homeowners to establish a relationship that legitimizes their attachment to the family cat. Some are so transported by feline love that they abandon their plans and lie down on the parking strip with the household kitty. This serves as a daily model for children in sharing and community building.

Therefore:

Install one or more fat, furry kitties on the front stoop.

Choose breeds like Tabby and Tortoiseshell for their coats of WARM COLORS (250). You’ll suddenly notice OLD PEOPLE EVERYWHERE (40).

241(b) PEE SPOTS (a.k.a., SEAT SPOTS, Revisited)

...Kids, like ANIMALS (74), need places to squat. Locate near TREE SPACES (171), or perhaps a BUILDING EDGE (160), preferably in a SUNNY PLACE (161).

Bears do it, so why shouldn’t children?

Kids resist admitting to adults that they need to stop their play in order to go potty. Therefore, they need places in the yard to do so without time-consuming bathroom rituals like door-shutting and hand-washing. Wise adults grant this privilege, after cautions against scandalizing the neighbors and stunting the dahlias.

Therefore:

Designate places in the yard where children can pause to pee.

To aid in the protection of the dahlias, employ RAISED FLOWERS (245). For obvious reasons, avoid locating in ROOF GARDENS (118).

195(b) STAIRCASE VOLUME, Revisited

... STAIRCASE AS A STAGE (133) and the original STAIRCASE VOLUME (195) patterns deal well with the aesthetics, flow and practicalities of stairs but don’t address the need to escape from the BED ALCOVE (188) through the FARMHOUSE KITCHEN (139). “Volume,” in the revised pattern, refers to acoustics.

Stairs that announce every coming and going of a house’s residents induce claustrophobia, eventually leading to the breakdown of the family unit.

Creaky wooden staircases evoke sweet memories of tiptoeing around so as not to wake the baby. Scaling them after a long day lulls one into the first stages of sleep, so comforting is the familiar noise. They may even sell an old house to a sentimental prospective buyer. But studies show that only a tiny number of proposed post-bedtime escapes are successful if the home has a creaky staircase. This sets the stage for conflict between parents and their adolescent children, just as the children are naturally seeking independence and establishing their own identities. Such conflict delays separation and can ultimately lead to either a premature or delayed empty nest.

Therefore:

Build stairs of solid materials. Do not assume that stair noises are worthy of preservation. Instead, fortify saggy, creaky old stairs with reinforcements under every joint.

One caveat to this pattern: CHILDREN IN THE CITY (57) who have access to a quiet staircase are often found DANCING IN THE STREET (63) and SLEEPING IN PUBLIC (94).

Writer Jane Radke Slade, fed up with DIY, finally broke down and hired a kitchen designer. After looking over the plans, a local cabinet salesperson said it best: “This looks like a pain in the ass. I’m not sure we even want to do this.”

This article was first published in ARCADE issue 24.2 in the winter of 2005.



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HAPPENINGS

Design-Minded Events in the Northwest



Comme des Garçons (Rei Kawakubo), Spring/Summer 1997. Collection of the Kyoto Costume Institute. Photo: Takashi Hatakeyama

Future Beauty: 30 Years of Japanese Fashion

Seattle Art Museum
Thursday, 27 June – Sunday, 8 September
seattleartmuseum.org

Traditionally, Western women's fashion has been all about the "fit." Symmetry. Line. Hourglass form. But in the early 1980s, avant-garde collections by Japanese designers like Rei Kawakubo and Yohji Yamamoto introduced a new aesthetic—deconstructive, asymmetrical silhouettes that were embodiments of tradition and imperfect elegance. Since then, the innovations of Japanese designers have revolutionized the ways we think and feel about fashion today.

This summer, the Seattle Art Museum will display over 100 of

these breathtaking garments from the last three decades—some never before seen in the United States. *Future Beauty: 30 Years of Japanese Fashion* features costumes by celebrated designers including the aforementioned Rei Kawakubo and Yohji Yamamoto, as well as Issey Miyake. Curated by renowned Japanese fashion historian and curator Akiko Fukai, the exhibition explores the unique sensibility of Japanese design and offers insight into the aesthetic intuition that informed a generation of Western designers including Martin Margiela,

For a complete calendar of events and to sign up for ARCADE's newsletter, visit arcadenw.org.

ARCADE
event

Ann Demeulmeester and Alexander McQueen.

The exhibit is thematically organized into three parts: "Praise of Shadows," featuring mostly black and white designs; "Flatness," considering basic geometries and the interaction between levelness and volume; and "Cool Japan," examining the mutually dependent relationship between street style and high fashion.

The Ghost of Architecture

Henry Art Gallery
Saturday, 13 July – Sunday, 29 September
henryart.org

The Henry Art Gallery presents *The Ghost of Architecture*, celebrating works given to the museum's permanent collection over the last five years. The exhibition includes works of photography, drawing, installation and video, many rarely or never shown at the museum. Featured artists—including Kevin Appel, Assume Vivid Astro Focus, Edward Burtynsky, Jacob Dahlgren, Carsten Höller, Los Carpinteros and Christian Marclay—evoke architecture through reference rather than representation, utilizing fragment, memory and displaced narrative. *The Ghost of Architecture* is curated by Deputy Director of Art and Education, Luis Croquer.

ByDesign

Northwest Film Forum
Friday, 19 July – Monday, 22 July
nwfilmforum.org

Co-presented by the Northwest Film Forum, AIGA-Seattle and ARCADE, ByDesign explores design and its intersections with film. This year's program features films on influential, Italian-born Lella and Massimo Vignelli; legendary film-title designer Pablo Ferro; and architects Rem Koolhaas and Frank Gehry. ByDesign also features contemporary short films in which design and motion graphics play a central role and a panel discussion with Seattle motion designers.

IN THE COMMUNITY

Grand Hotel: Redesigning Modern Life
Vancouver Art Gallery
Through 15 September
vanartgallery.bc.ca

MAKE GOOD SOCIETY
Speaker Series
MakerHaus
See makerhaus.com for info

SAF Architecture Walking Tours
Through 14 December
seattlearchitecture.org



JUNE 27-SEPTEMBER 8, 2013

Future Beauty features more than 100 garments that highlight the tremendous innovation of Japanese designers who revolutionized the way we think of fashion today. The show celebrates original designers such as Issey Miyake, Kenzo Takada, Rei Kawakubo, and Yohji Yamamoto, as well as younger designers influenced by popular culture and the dynamic street life of Tokyo.

Get tickets today at seattleartmuseum.org

Image: Kosuke Tsumura, *Final Home* coat, 1994, Collection of the Kyoto Costume Institute, Gift of Mr. Kosuke Tsumura. Photo by Takashi Hatakeyama.

Exhibition originally conceived by the Kyoto Costume Institute and Barbican Art Gallery, London. Seattle Exhibition organized by Kyoto Costume Institute in collaboration with the Seattle Art Museum. Exhibition supported by Wacoal Corp.

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END NOTE

Peter Arkle

FAILED (BUT FUN) EXPERIMENTS

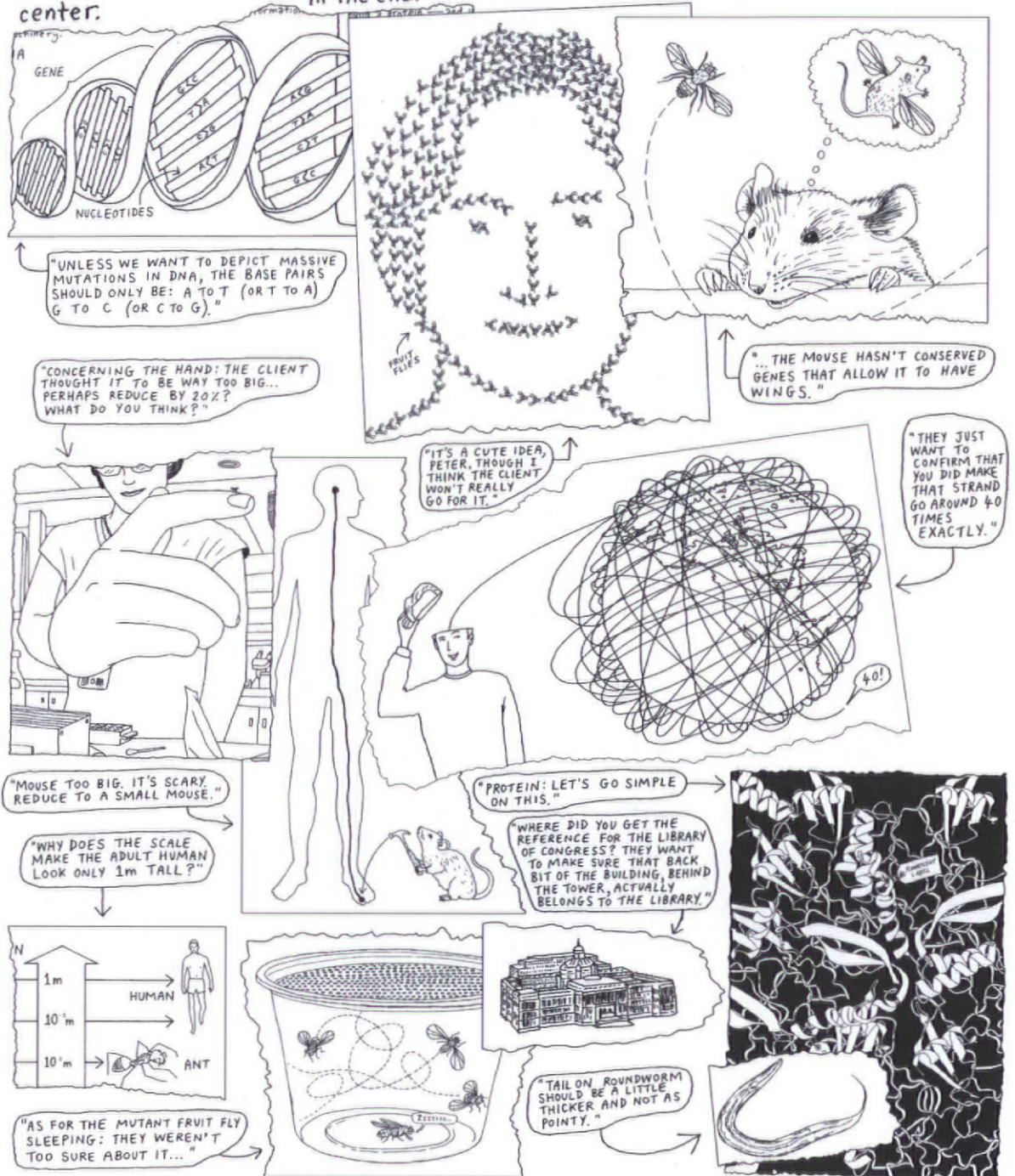
BY A FREELANCE ILLUSTRATOR
CALLED PETER ARKLE
WHO LIVES IN NEW YORK

Recently I illustrated a little book explaining (SIMPLY) the type of work that is going to be done at a new scientific research center.

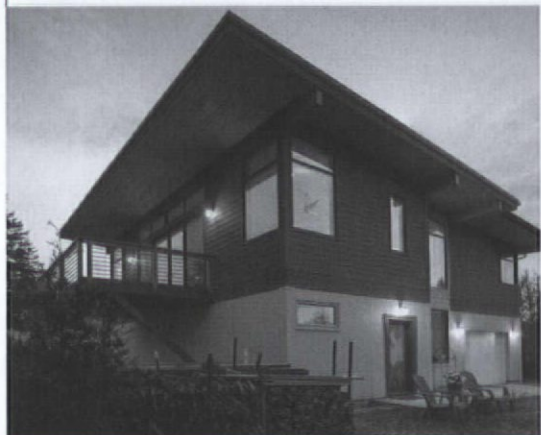
Turning neurological and genetic science into SIMPLE drawings isn't SIMPLE. Lots of trial and error is involved. Of course none of this appears in the book in the end.

This is a pity, because I think this process is (AS IN MOST PROJECTS I WORK ON) an enjoyable one.

SO NOW, BEFORE THEY ARE CONSIDERED TO A FOLDER IN A DARK CORNER OF MY OFFICE, HERE ARE SOME OF MY UNUSED DRAWINGS AND THE CLIENT COMMENTS THEY PRODUCED:



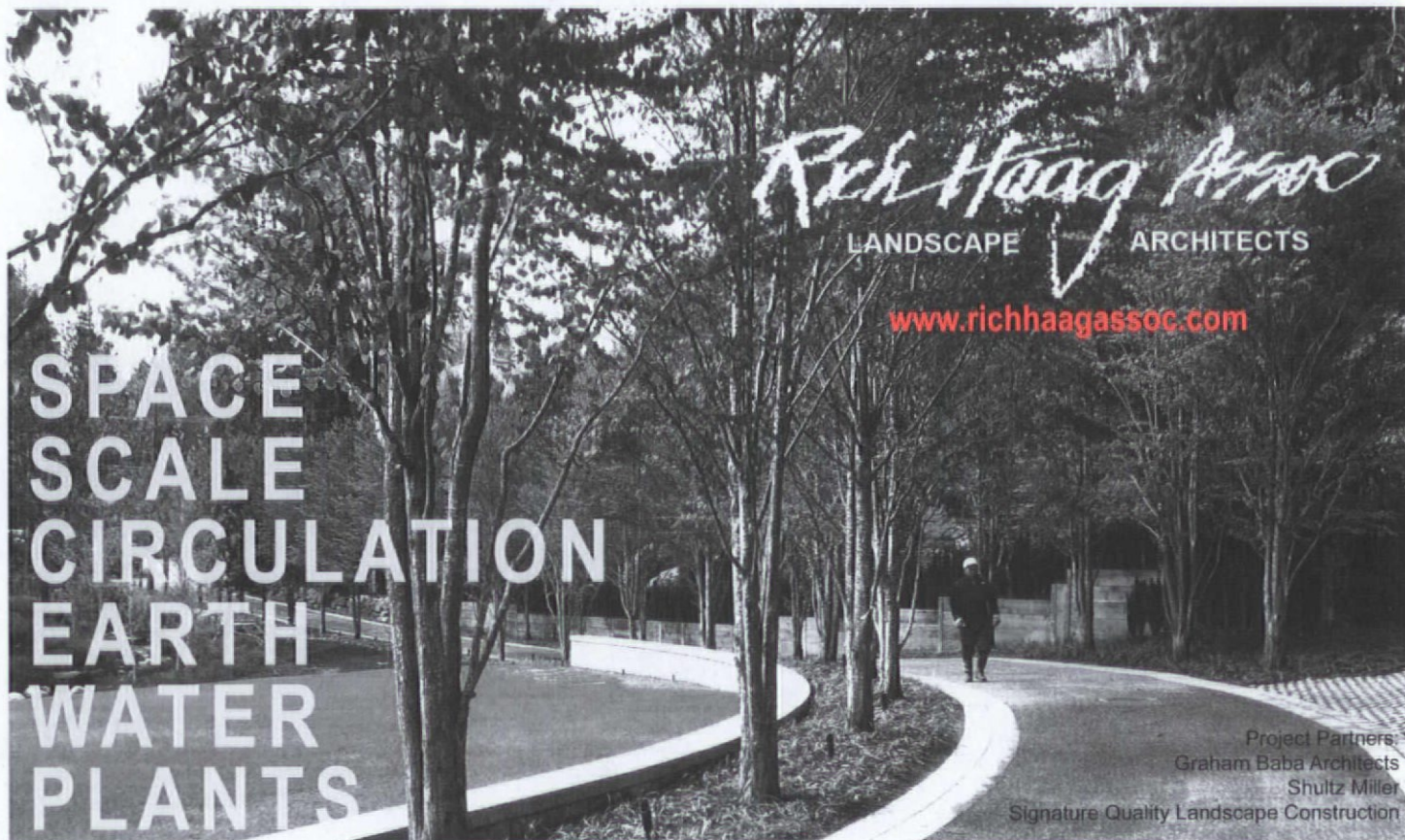
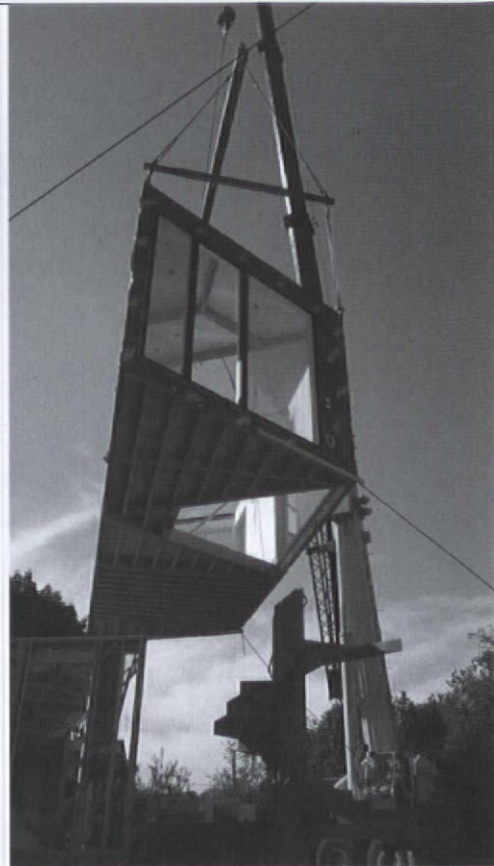
This illustration was first published in ARCADE issue 25.2 in the winter of 2006.



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A photograph of two construction workers on a wooden structure, possibly a roof or bridge, at sunset. The sky is a deep red, and the workers are silhouetted against the bright light. One worker is in the foreground, leaning against a large wooden beam, while another is slightly behind him. The scene is overlaid with a red tint.

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


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